Scanning - Shortwave - Ham Radio - Equipment
Internet Streaming - Computers - Antique Radio

Monitoring Times

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SCANNING THE SLOPES

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Also in this issue:

- Chicago Scanning
- A Trailer for All Seasons
- MT reviews Eton's Satellit 750 SW Portable

AOR introduces the AR-Mini

Big Features! Small Size!

This pocket-size communications receiver delivers BIG performance!

Actual size

The AR-Mini offers legendary AOR quality and a wide array of the most popular features found in the AR-8200 Mark III. But, the new AR-Mini does it all in a convenient pocket size water resistant version that's very easy on a budget.

Whether you use it for work or pleasure, you can take the AR-Mini with you to listen to public safety communications, airline traffic, marine communications, weather channels, trackside communications at car and motorcycle races, radio and television reporters in the field, shortwave communications from around the world, amateur radio frequencies, AM and FM radio signals, analog TV audio and more.

Powered by two AA Ni-MH cells (1.2v), the AR-Mini operates for approximately 22 hours on a single battery charge but it can also be used with AA alkaline batteries or with an optional DC cigar-lighter adapter.

AR-Mini Features include:

- 1000 memory channels (10 banks x 100 channels)
- AM, NFM: Triple conversion WFM: Double conversion
- TCXO for greater stability
- 100kHz ~ 1299.995 MHz (+/-2.5ppm)*
- CTCSS and DCS
- Cloning capability (AR Mini to AR Mini or through PC connection)
- RF attenuator
- Automatic or selectable tuning steps
- Scan speed: 8 steps/sec.
- Priority Channel
- 2 VFOs
- Memory channel skip
- Battery save function with auto power off timer
- Free downloadable memory management software
- Preprogrammed "bug" detector frequencies with level beep to find hidden transceivers
- Small size: 2.4" x 3.7" x 0.9" (without projections)
- Weighs only 7.4 oz with antenna and batteries
- Signal meter
- Low battery indicator
- SMA antenna connector

The AR-Mini is now available at your favorite AOR dealer!

AOR®
Authority on Radio

AOR U.S.A., Inc.
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The Serious Choice in Advanced Technology Receivers

Specifications subject to change without notice or obligation.
**Cellular blocked for US consumer version. Unblocked version available to qualified purchasers with documentation.*

WiNRADiO® Antenna Accessories

WiNRADiO is not "just" high-performance radios - we also make numerous antennas and antenna accessories for all kinds of applications, as well as complete radio monitoring systems. Browse our web site www.winradio.com and you might find exactly what you need to complete or improve your radio monitoring installation.

WiNRADiO WR-ACD-1800 HF-VHF/UHF Dual Antenna Combiner

The WR-ACD-1800 Dual Antenna Combiner is designed to provide a quick and easy solution to a common problem, connecting separate HF and VHF/UHF antennas to a single-input scanning receiver. It also contains Bias 'T' circuitry to provide DC power injection for active antennas.

WiNRADiO WR-DASP-2500 Dual-Action Surge Protector

The WR-DASP-2500 coaxial surge protector is designed to protect the receiver antenna input against damage caused by electrostatic discharge. This is achieved by a combination of two protective elements: a fast-acting semiconductor device and a gas-discharge tube.

WiNRADiO WR-UBF-1800 Universal Broadcast Filter

The WR-UBF-1800 Universal Broadcast Filter is a user-definable bandstop AM or FM broadcast filter or attenuator making it possible to filter out strong local broadcast stations interfering with reception or overloading a receiver.

WiNRADiO WR-BT-650 HF/VHF Power Injector (Bias 'T')

The WR-BT-650 Power Injector (Bias 'T') provides a means of injecting DC power in a coaxial cable, to power remotely-located devices. It features a very flat frequency response, and a wide frequency range, from 20 kHz to 650 MHz.

WiNRADiO WR-BT-3500 VHF/UHF Power Injector (Bias 'T')

The WR-BT-3500 Power Injector (Bias 'T') provides a means of injecting DC power in a coaxial cable, to power remotely-located devices such as active antennas, low-noise amplifiers and downconverters. This device can be used in a wide frequency range, from 50 to 3500 MHz.

WiNRADiO WR-LNA-3500 Low Noise Amplifier

The WR-LNA-3500 Low Noise Amplifier is an ultra-low noise figure preamplifier designed to operate in the range of 30-3500 MHz. It employs the latest Silicon Germanium Heterostructure Bipolar Transistor technology (SiGE HBT) to achieve excellent performance.

WiNRADiO WR-DNC-3500 Frequency Downconverter

The WR-DNC-3500 Downconvertor contains a high-stability local oscillator, mixer and filters to convert an incoming frequency range of 1700-3500 MHz down to 0-1800 MHz which can extend the frequency range of VHF/UHF receivers.

WiNRADiO WR-LWA-0130 Long Wire Adaptor

The WR-LWA-0130 Long Wire Antenna Adapter is designed to work on medium and short wave bands, covering a frequency range from 0.1 to 30 MHz. It is especially suitable for use with WiNRADiO shortwave receivers, such as the WR-G303 or WR-G313 series of receivers.

WiNRADiO WR-CMC-30 Common-Mode Choke

The WR-CMC-30 provides a means of reducing or eliminating common-mode noise from an antenna feedline (generated by computers, lamp dimmers and other electric or electronic appliances), resulting in a considerable increase of the received signal quality.

Monitoring Times

Vol. 27 No. 12 December 2008

Scanning the Slopes

By John Harr KD4GAW

It sounds idyllic: spending Christmas on the ski slopes of Colorado. And when not out on the slopes or enjoying the scenery, what better occupation for a radio buff than sitting by the fire with a scanner? Except that, whenever listening away from home, it's often necessary to learn a new vocabulary to make sense of what one hears.

Add another layer of fun to your vacation get-away and take along the scanner! If the family doesn't at first appreciate it, they will when bad weather hits and you need to know road conditions!

Story starts on page 10.

On our Cover: A View of the Village at Beaver Creek Resort (photo by John Harr)

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Reviews

Monitoring Times finally got its hands on the long-awaited Grundig Satellit 750 and put it through its paces. Our reviewer found it a bit of a puzzler: it certainly has some unique features, but is unique necessarily better? Yes and no, was *MT*'s finding. Turn to page 66 for the full review.

Yes, you can "have it all" and afford it, too, when you get RadioCom 6 from Bonito, according to John Catalano. But as always, sophisticated programs usually require some tricky set-up. So, this month, Catalano will lead you through installation of the program, step by step. See page 68.

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GRUNDIG
TIMELESS PERFORMANCE

60th Anniversary

LISTEN TO THE WORLD

G4 WORLD RECORDER

AM/FM/Shortwave Portable
Radio with MP3 And SD player | $200.00

- AM/FM-stereo and Shortwave (3000-29999KHz)
- Digital Display world-band radio
- Digital tuning methods including Auto-scan, Manual-San, Direct Key-in and Manual Tuning
- FM Station Tuning Storage (ATS) provides automatic acquisition of the strongest stations in your area
- Built-in 1GB/2GB flash, USB 2.0 high speed transmission

CONSUMER DIGEST BEST BUY AWARD 2007

G5 GLOBAL TRAVELER

AM/FM/Shortwave with SSB | $150.00

- AM/FM-stereo and Shortwave (1711-29999 KHz)
- Single Side Band (SSB)
- Digital Phase Lock Loop (PLL) dual conversion
- Digital Display world-band radio
- Station name input features allow a 4-character input of the stations call letters

G6 AVIATOR

AM/FM/Shortwave with SSB | $100.00

- AM, FM, Aircraft Band (117-137 MHz) and Shortwave (1711-30000 KHz)
- Dual conversion
- Three types of automatic scan tuning
- 700 memories with 4 character page naming
- 3 programmable alarm timers (volume and frequency can be preset)

Receives AM Band | Receives FM Band | Receives Shortwave Band | Alarm Clock | Headphone Jack

Satellit 750

AM/FM/Shortwave Radio with SSB | $300.00

- AM, FM, Aircraft Band (118-137 MHz) and Shortwave (1711-30000 KHz)
- Set 9/10 KHz AM tuning; set FM tuning range
- Single Side Band (SSB)
- Auto/Manual/Direct frequency key-in and station memory tuning
- 1000 station memories (each band 100 memories, 500 customizable)

GS350DL FIELD RADIO

AM/FM/Shortwave Radio | $100.00

- AM (530-1710 KHz), FM (88-108 MHz) and Shortwave – continuous coverage
- Highly sensitive and selective analog tuner circuitry with AM/SW frequency lock
- Rotary volume control
- Main tuning knob and independent fine-tuning control knob
- Variable RF gain control

Grundig Radio Line By:

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re_inventing radio

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1-800-793-6542

We are delighted to announce the publication of the 2009 edition of *World Radio TV Handbook*, the best-selling directory of global broadcasting on LW, MW, SW & FM

The Features section has a stimulating introduction to the art of FM DXing, reviews of the latest equipment, and a fascinating account of visits to five All India Radio stations.

The remaining pages are, as usual, full of information on:

- National and International broadcasts and broadcasters by country with frequencies, powers, languages, station addresses, email, web, phone and fax, leading personnel, QSL policy, and more
- Clandestine and other target broadcasters
- MW frequency listings by region
- International and domestic SW frequency listings as well as DRM listings
- International SW broadcasts in English, French, German, Portuguese & Spanish, listed by UTC
- Equipment reviews, *Digital Update* and more
- A further revision of TV by country
- Reference section with Transmitter Site Location Table, Standard Time & Frequency Transmissions, DX clubs, Internet Resources, and much more

Available December 2008

SOME COMMENTS ON WRTH 2008

WRTH 2008 continues to set radio hobby standards. It remains the most respected and authorative radio reference book in the world, and should be in every hobbyist listening post. The dedicated staff at WRTH have once again provided the radio listener with the ultimate guide – *Gayle Van Horn W4GVH, Monitoring Times*

The 2008 edition, the 62nd, is once again the best and most comprehensive ever . . . we highly recommend it – *Radio Netherlands Media Network*

Authoritative information for everyone involved in international broadcasting – *Communications Africa*

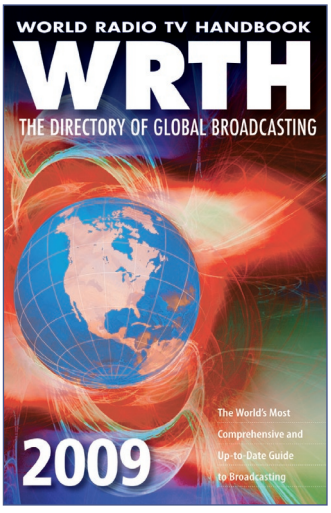
WRTH 2008 remains the best and most comprehensive shortwave guide. No other guide is as detailed. A must for every listener's and amateur's shack – *Hannes Grünsteidl*, Austria

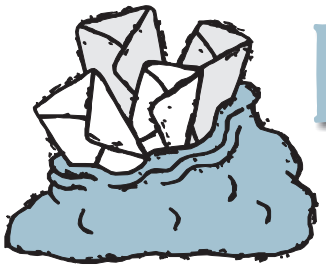
I am very impressed with the *WRTH* these days and the updates are absolutely outstanding – *Hans Johnson, Cumbre DX*

I find *WRTH* to be my radio reference of choice – *Bentley Chan*, Hong Kong

I have never seen such a wonderful informative book, it's like a bible for DXers – *Imran Mehr, Unique Radio Listeners' Club,* Pakistan

I congratulate you on producing such an excellent reference book – *P M Youds*, UK





LETTERS TO THE EDITOR

Bletchley Park and Alan Turing

"I read with great interest Roy Stevenson's fine article on Bletchley Park which appeared in the October issue on *Monitoring Times*.

"However, in referring to the film, *Enigma*, which was based on the book of the same name by Robert Harris, Stevenson writes that the main character is based on Alan Turing. That this is clearly not the case has been confirmed by Harris himself. In a letter to Andrew Hodges, the author of the excellent biography, "*Alan Turing: The Enigma*," Harris pointed out that Tom Jericho, the chief protagonist of the film, was a composite, and was never intended to be taken as Alan Turing. See **www.cryptographic.co.uk/enigmareview.html** for a review by Hodges of the film. Also **www.turing.org.uk/** "

"... I was born in the U.K. in 1930, and first heard of Alan Turing when I read his essay on what would become known as 'The Turing Test' in *The World of Mathematics*, a four volume anthology of mathematical writings, which I read on my first trip to The States, when I was a research associate in the physics department of Duke University from 1957 to 1959, and I still have my copy.

"I spent 1960 at the (British) National Physical Laboratory in Teddington, just outside London. Turing had worked there for a while just after WW2, and there were still stories about him circulating. He couldn't stand the bureaucracy and soon moved to Manchester University to work on one of the early digital computers. My reaction to the NPL was exactly the same as Turing's and, despite being an established civil servant, I left after a year, going first to work at the Battelle Institute in Geneva, Switzerland, and then returning to the States as an immigrant in 1962, to join DuPont here in Wilmington, Delaware.

"To backtrack a little, in 1949 I entered Manchester University to study chemistry, and graduated from Manchester in 1952. Turing and I were both there at the same time, although I was not even aware of his existence at that time."

Derick Ovenall, Wilmington, DE

Digital TV Transition

"Ken, thanks for your fine columns and a fine magazine!

"I need to take exception to your answer to Chris in the September issue regarding the DTV transition. You said, 'with very few exceptions, all digital terrestrial TV stations are moving to UHF.....'

"In fact, with very few exceptions in the low channels (2 - 6), all stations that have analog assignments in the high VHF (7 - 13) will be returning to those assignments after the transition on February 17, 2009. Most of the stations with low-channel VHF assignments will be staying on the UHF DTV channels assigned to them.

"My source is the **FCC.gov** site which has a final table of channel assignments in their DTV section.

"I have also corresponded with the Chief Engineer of WTOP (Channel 9 in Washington, DC) who indicated to me that they and Channel 7 in DC are both returning to their respective channel assignments after their analog transmitters are taken off the air.

"I have also come across a series of antennas by Winegard that cover the high VHF and UHF channels; their specs look pretty good. The series is the 7694P through the 7698P."

Gene K3SVA, St. Michaels, MD

"Well, I have to say that I got it about half right, which makes me over-qualified to work on Wall Street these days. You're right about those stations. In the November issue I got a chance to correct myself a little more regarding the frequency election process.

"My source in the FCC has directed me to this insanely long document which treats the whole process in the manner that only the FCC could. Get yourself a big cup of coffee and read this (believe me, you'll need the caffeine!)." **http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-07-228A1.pdf**

Ken Reitz KS4ZR

Think about the population who likely watches analog TVs from an antenna ... For a humorous but a possibly all-too-realistic look at making the digital switch, check out **www.youtube.com/watch?v=DFuMO9oazwQ**

Below 500kHz

"I have an old Aqua Guide 702 radio direction finder that I use to hunt for non-directional aero beacons in the 'basement' band. The radio works on 8 D cells, but I would like to ditch the batteries and just run it off a regular wall outlet in my shack. The manual states the following with respect to power supply: 13.6 VDC Nominal, 11.0 V min. - 16.0 V max

"As you can see from the attached photo, there is an opening for a three-pronged 12 VDC cord.

"Do you have any idea what type of plug or adaptor I need? Do you where I could buy anything like this? Your input would be most appreciated. Thanks!"

Matt Stanley, Huntington, New York

"Thanks for writing to *Below 500 kHz*! The AquaGuide 702 unit that you have appears to be very similar my 705 model. The power plug is a type that is commonly used on CBs and some radio scanners. I have an extra one in my stash, and will send it to you free of charge if you'll send me your postal address. There's just one catch: You'll have to send me some loggings that you hear on the radio!"

Kevin Carey

(To which Matt Stanley replied, "One more reason to love *MT* – the columnists truly know their stuff."

"Thanks for posting the anglefire site for DF receivers in the September issue. (**www.angelfire.com/space/proto57/rdf.html**)

"I have had a Raytheon GM 114 B receiver that I need a schematic for and have not

continued on page 65

This column is open to your considered comments. Opinions expressed here are not necessarily those of Monitoring Times. Your letters may be edited or shortened for clarity and length. Please mail to Letters to the Editor, 7540 Hwy 64 West, Brasstown, NC 28902 or email editor@monitoringtimes.com

Happy monitoring!

Rachel Baughn, Editor

COMMUNICATIONS

by Ken Reitz

SHORTWAVE/AMATEUR RADIO

RNW Stops NA Broadcasts

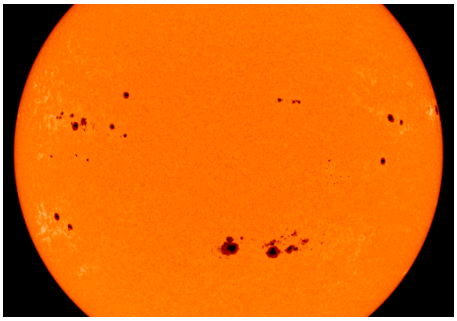
Radio Netherlands Worldwide (RNW) ceased shortwave broadcasts to North America October 26. The long-time international broadcaster cited the same reasons that put an end to BBC and others beaming to North America: extensive use of live, on-demand and podcast audio via the Internet, as well as feeds on Sirius/XM satellite radio and Direct-To-Home (DTH) satellite TV.

Listeners in North America who don't want to subscribe to satellite radio can catch popular RNW programming on Free-To-Air (FTA) satellite on AMC 4 (101°W) on transponder 27 (11.655 GHz), Symbol Rate: 30,000. RNW feeds are also found as part of World Radio Network's Galaxy 25 (97°W) feed on transponder 27 (12.177 GHz) using a Symbol Rate of 23,000. Any inexpensive FTA system is capable of receiving either of these downlink transmissions.

Hey Dude, Where's my Sunspots?

According to NASA, as of September 27, there were 200 days this year that the sun was blank: no spots. In the last 54 years the worst year for low sunspots was 1954 when the sun blanked-out on 241 days.

Spotless! This photo of the Sun taken by the Solar and Heliospheric Observatory (SOHO) September 27, 2008 shows the Sun without any spots. It was one of 200 such days so far in 2008. (Courtesy: NASA)



Ah, the good old days. September 27, 2001 shows what the Sun can do when it really wants to. (Courtesy: NASA)

"We are experiencing a deep minimum of solar cycle," said David Hathaway of the NASA Marshal Space Flight Center." This is not news to hams and shortwave listeners. But, Hathaway also said, "While the solar minimum of 2008 is shaping up to be the deepest of the Space Age, it is still unremarkable compared to the long and deep solar minima of the late 19th and early 20th centuries." NASA notes that it was "routine" to have 200 to 300 spotless days per year.

Radio New Zealand Celebrates 60th

What began on September 27, 1948, as Radio New Zealand, using second-hand U.S. surplus transmitters that were relics of World War II, has become Radio New Zealand International (RNZI), now celebrating sixty years on the air. Today, RNZI is an award winning international broadcaster providing a vital link to the nations of the Pacific via the 18 radio stations that rebroadcast its signal.

Hams to the Rescue in Ike Aftermath

Several media outlets talked up the value of amateur radio operators in the aftermath of hurricane Ike which devastated a massive region of the Texas Gulf coast this past September. Hardest hit Galveston Island appreciated the efforts of hams who stayed on the island when the storm hit. One report in the Galveston press said, "Amateur radio operators began to pick up the slack relaying messages for a multitude of services including the Corps of Engineers, Highway Patrol and Texas National Guard."

CW Op Rescued from Mountain

A report in the Everett (Washington) *Herald* detailed the misadventures of a hiker who fell and broke his leg while camped at an altitude of about 6,000 feet in the high Cascades of Western Washington state. Using a portable QRP CW rig, the injured hiker sent out a distress call on a frequency that just happened to be monitored by another ham 600 miles away in Montana. According to the article, the Montana operator spent nearly two days relaying information from the hiker to rescuers who eventually got the injured man out on horseback.

High-Tech Op Rescued from Mountain

CNN reported the story of another hiker, in the Canadian Rockies near Banff, who fell and severely injured his knee some ten kilometers from the nearest road. There was no cell phone coverage in the area and he hadn't been packing a CW QRP rig. Instead, he used the 911 feature on his SPOT Satellite Messenger which alerted emergency services and gave his GPS coordinates. In short order a Banff National Parks helicopter was sent to his exact location. According to the CNN report, he was transported

Wilderness rescue is just a satellite call away with this little hand-held satellite transmitter from SPOT Satellite Messenger ($169.99 plus $99.99 annual subscription). (Courtesy: FindMeSpot.com)

to a hospital and the next day underwent surgery to repair the ruptured knee ligaments. For more information on SPOT, check out their web site: **www.findmespot.com**.

PUBLIC SERVICE

Scanner Listener Thwarts ID Thief

A Milford, Massachusetts resident, monitoring the local police frequency, heard an officer radio in the name of a shoplifting suspect. The suspect gave the name of the scanner enthusiast's neighbor. Since this had happened before, the scanner listener knew there was something wrong and called the neighbor and police to tip them off that the suspect was using a false identity. It turns out the ID thief was wanted on other charges in other nearby localities as well.

DTV Conversion

Consumer Reports, the monthly consumer magazine, is making available online an updated list of Digital Television (DTV) converter boxes. Some 24 individual DTV models were reviewed as of this writing and divided into three picture quality categories. *Consumer Reports* graded each model as being basic, better or best in a number of important features. To view the latest list check out: **www.consumerreports.org/cro/electronics-computers/televisions/digital-tv-converter/ratings/dtv-converter-boxes-ratings.htm**

The list, however, will not make it easy for consumers to choose. For example, one of the best models for the guide feature was judged to have the worst picture. Unfortunately, *Consumer Reports* did not look for HDTV compatibility or surround-sound audio output options on any listed models.

SATELLITE RADIO

Satellite Radio New Price Scheme

Details of the new Sirius/XM subscription plans, which were mandated by the FCC prior to approval of the merger, have finally been published. It appears that Sirius/XM has learned from satellite TV and cable programmers that you can milk more money out of each subscriber by packaging the most popular programming in

Sirius Starmate 5 dock and play radio is the first a la carte satellite radio that also supports the best of XM and retails for $129.99 (with vehicle docking station, home docking station extra). (Courtesy: XM FanStore.com)

evermore expensive packages. The bottom tier package makes for great ad copy and satisfies one of the FCC's meager requirements for the merger.

Under the new pricing scheme, both offer a la carte programming packages: Sirius' $6.99/month lets you pick 50 channels from their channel line-up, but doesn't include live sports or races, premium channels, or online listening. XM listeners can pick 55 channels from their line-up, but costs $9.99/month and also doesn't include on-line listening.

XM allows an online-only subscription for $7.99/month. To listen to Sirius' online channels, you'll have to buy into their "Family Friendly" package which gives you 115 Sirius channels but delivers only low-grade, on-line listening. For their "premium Sirius internet radio upgrade" you'll have to move to the "Family Friendly + Best of XM" package for $14.99/month.

XM's top tier is called "Everything + the Best of Sirius" and gives you 180 channels, including every XM channel plus NFL play-by-play, two full-time Howard Stern channels, NASCAR races and shows, as well as Playboy Radio and Martha Stewart Living Radio. You also get unlimited access to XM on-line. But, at $16.99/month, it's the most expensive package available.

Sirius has also announced the first receiver to support the Best of XM and a la carte programming. At $129.99 plus shipping and $49.99 plus shipping for the home docking station, the Starmate 5 dock and play radio is not exactly a cheap way to get started in satellite radio.

Meanwhile, the effect of the economic downturn on the economy has had a big impact on what's left of Sirius/XM. Following the merger and the fall stock market slide, Sirius/XM was trading at a low of 50 cents/share when it had been trading as high as $3.94/share during the year.

According to an article in the *Washington Post* from September 9, 2008, the merged company has more than a billion dollars in debts that will come due in 2009 starting with a $300 million payment in February. At the time the article was written, highly-paid Sirius CEO, Mel Karmazin was planning to raise the money through bank debt. Of course, that was before Wall Street banks tanked. Could it be that the federal government will find that Sirius/XM is "too big to fail?"

FCC ENFORCEMENT

Air Tower Interference from TV

Following an investigation into interference complaints, the FCC has issued a citation to a Seattle man after it was revealed that a "Part 15 device attached to a television…was causing interference to airplanes and the FAA's SEATAC Airport Control Tower." No word was given as to the nature of the device or how far away it was from the airport.

Gremlins in the Chopper

On September 13, according to FCC documents, an Enforcement Bureau agent of the FCC's Honolulu Office responded to a Coast Guard complaint that transmissions from an Emergency Locator Transmitter (ELT) were coming from somewhere at Honolulu International Airport. The agent located the transmitter aboard a helicopter on the south ramp of the airport across from Air Service Hawaii. For some reason the ELT on board "was activated in the absence of any actual emergency situation." No doubt, fines will follow.

FCC Sweeps Miami Area (Again)

Over a three week period in September this year, the FCC has investigated the transmission of unlicensed FM operations in the Miami area. Those investigations have resulted in seven "Notice of Unlicensed Operation" being issued to as many individuals. Transmissions on 90.5, 90.7, 90.9, 91.9, 92.5, 95.9 and 103.9 MHz were received by FCC investigators, who determined that power from these unlicensed signals ranged as high as 131,825 microvolts/meter. Unlicensed operation of FM transmitters is allowed by FCC rules as long as transmitters don't exceed a 250 microvolts/meter limit.

San Diego TV Station Fined $25,000

The FCC charged KUSI-TV, Channel 51 of San Diego, California, with willfully and repeatedly failing "to make accessible to persons with hearing disabilities emergency information that it provided aurally in its programming for KUSI during a wildfire emergency" in the San Diego area on October 26 and 27, 2003. After an investigation by the Commission, some 22 such instances were cited and the station was issued a Notice of Apparent Liability for Forfeiture of $25,000. It could have been worse; under FCC rules, the station might have been hit with a $160,000 fine.

16 Year-old Causes CG Headaches

In August 2007, the U.S. Coast Guard in St. Petersburg, Florida, had responded to false distress/mayday calls on channel 16, the international distress, safety and calling channel (156.800 MHz). After complaining to the FCC about the interference, an investigation was launched.

Using direction-finding techniques, investigators determined that the calls were coming from a mobile home community in nearby Largo, Florida. Local police took a minor, living in the community and identified in FCC documents as "John Doe," into custody and confiscated one marine radio, two CB radios and a marine battery. Mr. Doe was also said to have a whip antenna outside his bedroom window. The Commission checked their records to determine that Mr. Doe had no license for the marine radio which was, in fact, operable on channel 16.

The Commission fined Mr. Doe $18,000, and he spent the months following custody in a juvenile detention center,. After an appeal, based on Mr. Doe's expressions of "sincere remorse for his actions" and the fact that he had no source of income, the Commission cancelled the forfeiture notice and admonished the youth for the problems he caused.

CONSUMER'S CORNER

Sony Recalls Notebook Computers

The Consumer Product Safety Commission, along with Sony, announced a voluntary recall September 4, 2008 for certain VAIO TZ-series Notebook computers, of which they believe there were some 73,000 sold, because "irregularly positioned wires near the computer's hinge and/or a dislodged screw inside the hinge can cause a short circuit and overheating. This poses a burn hazard to consumers." Not all units are affected; however, consumers are advised to call Sony at 888-526-6219 or visit their web site: **www.sony.com/support** for additional information.

"Communications" is compiled by Ken Reitz KS4ZR (*kenreitz@monitoringtimes.com*) from news clippings and links supplied by our readers. Many thanks to this month's fine reporters: Anonymous, Rachel Baughn, John Mayson, and Larry Van Horn.

Scanning the Slopes

By John Harr KD4GAW

A Snow Boarder at the Foot of the Slopes at Beaver Creek Resort

Are you contemplating a trip to Colorado for a skiing holiday? Last year, my wife and I visited several of the ski resorts in central Colorado to visit our daughter, Laura, for Christmas. Of course I took my new GRE PSR-500 scanner with me for a maiden trip to a new location.

It was not a disappointing trip. We flew from Pensacola Florida to Atlanta and then to Denver, where we rented a car for the trip up into the ski areas, about 100 miles to the west. This was the first time I attempted to carry any of my scanners on board an aircraft in my carry-on luggage. I am pleased to report that it raised no alarms and sailed through the x-ray machine in my carry-on bag without issue. We spent the night in Denver and set out the next morning for the trip into the Rockies.

Ski Season

This was our first trip to Colorado, so we were struck by the sudden rise of the Rockies above the relatively flat plain where Denver is located. We were headed for our hotel in the small town of Frisco, located among some of the most popular ski resorts in Colorado; Vail, Breckenridge and Beaver Creek. The skiing season at these resorts begins in late November and runs until April. The exact dates each year depend on the weather. Normally there are five full months of skiing to be enjoyed at these resorts each year.

The Resorts

The town of Breckenridge is located in Summit County and lies at 9300 feet above sea level. It was founded in November 1859 by U.S. Army General George E. Spenser and named after President James Buchanan's Vice President, John Cabell Breckinridge. The ski resort there opened in 1961 and started the skiing industry boom in Colorado.

Vail is located in Eagle County and was the second resort to open in Colorado. Pete Seibert and Earl Eaton founded and opened Vail in the winter of 1962. It is the largest single mountain in the US and has 5000 acres and 33 lifts, making it the most popular ski resort in the United States. The town is preserved as a quaint and historic district and has many restaurants, shops and businesses located on the long main street that runs through the town.

Beaver Creek resort is located near the town of Avon, also located in Eagle County. It is the newest of the three resorts, having opened in 1980. The resort is based upon a replica European village and has state-of-the-art facilities. It is located eight miles from Vail resort and is owned and operated by Vail Resorts, Inc.

Resort Activities

If you have been to any resort to ski, you are probably very familiar with the activities associated with a ski resort. However, this was our first exposure to a resort of this type, so I had a few lessons to learn. First of all, I learned what a "snowcat" was. For those of you not familiar, it is the term used to describe an all terrain vehicle that consists of an enclosed cab riding atop a set of tracks, like an Army tank. They are used to transport slope workers to locations on the slopes and to groom the ski runs each night to prepare them for the next day's wave of skiers.

I was able to listen on my scanner to the "Boss" directing the snowcat operators as they scraped, pushed and shaped the snow to achieve the near perfect conditions on the ski

Interstate I-70 Outside of Vail

The Skating Rink at One of the Resorts

runs. All snowcat operators and supervisors have a radio in their snowcats.

These operations were continuous at all three resorts from around 8:00 p.m. until 6:00 or 7:00 a.m.

All the runs had names, and I found it was helpful to pick up one of the free ski run maps available at the resorts. Using the maps I was able to follow the progress of the "cats" as they did their work. It was difficult to get a good night's sleep, as the air waves were filled with reports of stalled equipment and visibility problems from the blowing snow. I did not want to miss any of the action!

Most of the operators and workers at these resorts are young men and women hired for the ski season from locations all over the world. Many of them only work at the resort for one or two seasons. Therefore, most operators of the equipment, snowcats, and lifts are not seasoned operators. They are trained and led by a few experienced persons that have worked the slopes for several years.

As a result, the radio frequencies are filled with calls for assistance or advice in operating the equipment. For instance, one morning as one of the lifts was being inspected prior to being opened to the skiers, the operator encountered a problem with one the pins securing the lift chair to the cable. He was unable to repair the problem on his own and contacted the supervisor who gave advice and offered to come by and assist. Radio communications such as this can be heard on the radio between 6:00 and 8:00 a.m. as the lifts, gondolas and other equipment are prepared for the day's operations.

Each ski resort has a safety patrol and rescue team to attend to skiers that are injured or otherwise in danger. These teams, on skis or using snowmobiles, are dispatched by a main dispatch center which also can contact local EMS services if necessary. One morning at 8:30 a.m. I heard a dispatch for a response to an injured skier with a broken ankle. Apparently he injured himself on the first trip down the slope only a few minutes after the slopes opened for the day! Dispatch had the local EMS waiting at the bottom of the hill to transport the skier to a local medical facility.

Local Activity

While all this action is happening at the resorts, the local law enforcement agencies are busy with responses to automobile crashes, drunk drivers, disturbances at local bars and taverns, and other incidents. Although the local permanent population of these small mountain towns is only a few thousand at most, the flood of tourists and skiers during the winter swells the populations by a factor of ten. This influx of visitors keeps the local sheriff's department and town police hopping to keep up.

The snow at these higher elevations is very dry due to the low temperatures. This dry snow is susceptible to blowing and drifting, so roads are constantly being covered by snow – even if there is no falling precipitation. I heard numerous calls on the local law enforcement systems, as well as the Colorado State Patrol channels, concerning stranded commercial vehicles, cars, and trucks off the road on secondary roads as well as Interstate I-70.

Interstate I-70 is the main thoroughfare through this area of Colorado, and keeping the interstate clear of ice and snow in the winter is a daunting chore. The Colorado Department of Transportation (DOT) is responsible for this task. Snow removal is a large part of the Colorado DOT's responsibilities.

The Vail Pass, at an elevation of 10,635 feet, is the area's most difficult stretch of Interstate to keep open. Winds blowing the dry snow from the surrounding peaks keep the DOT busy almost continuously, pushing the snow accumulation to the side of the highway and spreading salt and gravel to keep travel safe for motorists.

I listened to snow removal communications over the pass and on other parts of I-70 on DOT's frequencies. As one would expect, the frequencies become very busy during heavy snowfall but are always active, even when the weather is clear, due to the blowing snow.

The Slopes of Beaver Creek in the Background

Fire Rescue on a Call in Downtown Breckenridge

Types of Communication Systems

Communications used in this area of Colorado use analog systems with the exception of the State Digital Trunked Radio System (DTRS) used by the State Patrol. This is a digital P-25 compatible system, so you will need a digital scanner if you want to hear those transmissions. The small towns that host the resorts use VHF analog conventional communication systems; however, some of the resort communications are conducted using trunked systems.

Take Your Scanner with You!

Even if you are not interested in skiing, there are opportunities for anyone with a scanner among the ski resorts of the central Colorado Rockies. Like any large commercial operation, the ski resorts use radio communications to coordinate activities, while the local and state agencies are involved in reacting to the weather and conducting law enforcement operations.

If you are headed to the mountains this winter don't forget your scanner! There are always interesting communications for you to monitor, and in the winter months, it could also be a matter of your own safety!

Frequency List (MHz)

Breckenridge City (Discrete Analog)

154.875	Breckenridge PD
154.950	Breckenridge Fire

Breckenridge Area Ski Operations (Discrete Analog)

464.675	Ski Lifts, Arapaho Basin
461.825	Ski Lifts, Breckenridge
461.300	Ski Patrol, Breckenridge
452.100	Main Dispatch, Breckenridge
452.050	Ski Lifts, Keystone

Vail Ski Resort System (LTR Passport System)

Ch	*Frequency*
01	452.4625
02	461.3750
03	461.6625
04	462.0625
05	463.5875
06	451.9375
07	452.2375
08	462.6500
09	461.5625
10	461.8375

Eagle County (Motorola Type II SmartZone System)

Site	*Name*	*Channels*
004	Beaver Creek Resort	855.7125, 856.7625*, 857.7625*, 858.6250*
006	Vail	858.9625*, 859.9625*, 860.9625*
008	East Vail	857.2650, 858.2625, 859.4375*, 860.4375*

Note – * Denotes Control Channel

Selected Talk Groups for Eagle County

Talk Group	*Activity*
1296	Colorado State Patrol
1744	Colorado State Patrol
4688	Colorado State Patrol
368	Avon PD
400	Avon PD
880	County Ambulance
1168	Eagle FD
1584	Mountain Rescue
1648	EMS
3504	East Fire Dispatch
3536	West Fire Dispatch
304	City of Vail PD
336	City of Vail PD
944	City of Vail FD

State of Colorado (Discrete Analog)

151.0850	Department of Transportation (Eagle County)
154.9050	State Patrol Aircraft
155.7300	State Patrol (Eagle County)
154.6800	State Patrol (Eagle County)
155.4450	State Patrol (Summit County)

Colorado in early spring (photography by Joan Heinen)

Scanning Chicago

By John Mayson

Grab your scanners and put on some comfortable shoes. This month we're going to take stroll around the Windy City – Chicago, Illinois.

Chicago is the largest city in the midwestern United States. With almost three million inhabitants, it is the third largest city in the country, and the area's nearly ten million residents make Chicagoland also the third largest metropolitan area in the nation. The area boasts major airports, ports, attractions, and transportation systems, making Chicago the perfect destination for radio enthusiasts.

Chicago is synonymous with many things, including beastly winters and strong winds coming off Lake Michigan. However, this may not completely explain the origin of their famous nickname "The Windy City." Other cities are far windier. Some nineteenth century writers gave the moniker to Chicago because of the reputation earned by boastful local politicians and labor leaders giving long-winded speeches.

I will concede the origins of "The Windy City" are debatable, but it segues nicely into more observations I made of "Paris on the Prairie" – a name city planner Daniel Burnham bestowed on the city. Chicagoans are very proud of their city and love to show it off. Local residents were eager to help us navigate our walking tours of the city. So grab your walking shoes, lather on the sunscreen (or better yet, pull on your parka), and charge those scanners. We're off to Chicago!

About this article

A glance of a map of the Chicago area reveals not only a large city but scores of smaller cities and towns reaching from the Indiana state line up to Wisconsin and many miles west. Cook County alone has about 130 municipalities, including Chicago. Virtually every dot on the map represents a police department, a fire department, EMS, and road crews, and this doesn't even take into account the dozens of frequencies and hundreds of trunked talkgroups used by sheriff's departments, state police, federal agencies, air traffic control, and various other departments.

We could dedicate much of this month's issue just to the Chicago area. Instead we're going to focus on the city proper and only a handful of the suburbs. I encourage any readers out there to submit articles covering areas we miss this month. I also call your attention to two related articles recently published in *Monitoring Times* – "Monitoring Chicagoland's Airports," March 2008, and "The Illinois StarCom21 State System," August 2008.

Chicago Police Department

The Chicago Police Department (CPD) is one of the oldest law enforcement agencies in the world and is the second largest in the United States behind New York's. The CPD has battled everything ranging from barroom brawls of a frontier town, to Al Capone and his gang, to guarding many high profile landmarks from terrorism.

CPD can be found across the radio spectrum. Their primary communications take place on an analog, conventional UHF network, but they can be heard on VHF mutual aid frequencies and their trunked system.

ZONE DISPATCH CHANNELS

(See figure 1 for zone map)

Frequency	CTCSS	Description
460.475	107.2	Zone 1 - Districts 16 17
460.050	127.3	Zone 2 - Districts 19 23
460.225	110.9	Zone 3 - Districts 13 14
460.150	114.8	Zone 4 - Districts 1 18
460.500	167.9	Zone 5 - Districts 2 21
460.400	156.7	Zone 6 - Districts 7 8
460.075	146.2	Zone 7 - District 3
460.200	136.5	Zone 8 - Districts 4 6
460.025	91.5	Zone 9 - Districts 5 22
460.100	151.4	Zone 10 - Districts 10 11
460.375	186.2	Zone 11 - Districts 20 24
460.425	94.8	Zone 12 - Districts 15 25
460.450	103.5	Zone 13 - Districts 9 12

CITYWIDE CHANNELS

Frequency	CTCSS	Ch	Description
460.125	173.8	1	Traffic/Gangs/Housing
460.175	123.0	2	Detectives/Canine/Vice
460.275	141.3	3	Wanted/Maintenance/Admin
460.325	192.8	4	HR/Schools/Youth/Marine
460.350	97.4	5	Subway/Emergency/Events
460.250	162.2	6	Emergency/Alt. Zone Dispatch
460.300	131.8	7	Command/Phone Patch
460.525	179.9	8	Unit-to-Unit

MUTUAL AID CHANNELS

Frequency	CTCSS	Description
155.370	CSQ	Mutual Aid
155.475	CSQ	ISPERN Ch. 1
154.650	CSQ	ISPERN Ch. 2

CHICAGO PD TRUNKED RADIO SYSTEM

Motorola Type II Analog

856.9375, 857.9375, 858.9375, 859.9375, 860.9375, 855.5875, 860.7875 MHz

A summer view of Lake Michigan with Lake Shore Drive in foreground

Family in front of skyline on Navy Pier

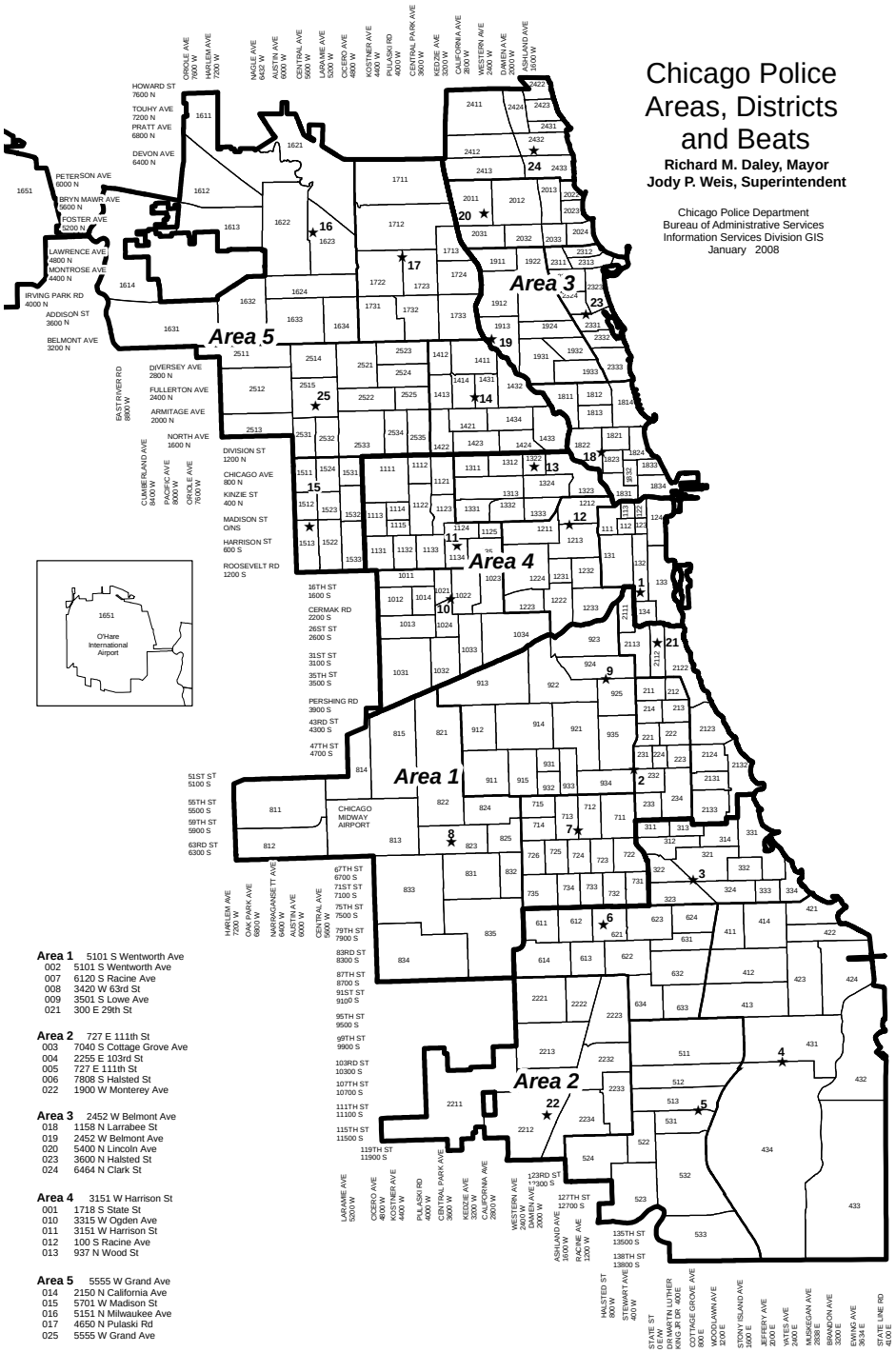
Talkgroup	Description
352	Mayor and Dignitary Protection
360	Mayor and Dignitary Protection
16384	Narcotics
16400	Narcotics 1A
16416	Narcotics A
16432	Narcotics 1B
16496	Narcotics
16672	Narcotics
16680	Narcotics
16720	Narcotics
16736	Narcotics
16768	Narcotics
16896	Narcotics C
16912	Narcotics D
16920	Narcotics
16928	Narcotics E
16944	Narcotics F
16952	Narcotics
16960	Narcotics G
16976	Narcotics H
16992	Narcotics I
17008	Narcotics J
17024	Narcotics K
17040	Narcotics L
17056	Narcotics M
17072	Narcotics N
17088	Narcotics O
17168	Narcotics
17176	Narcotics
17184	Narcotics
18464	Gangs
18480	Gangs
18944	Gangs
18960	Gangs
18976	Gangs
18992	Gangs
19008	Gangs
19024	Gangs
19040	Gangs
19056	Gangs
19072	Gangs
19104	Gangs
19120	Gangs
24624	Vice
25120	Surveillance
25136	Surveillance
28688	Surveillance
29696	Detectives
29712	Detectives
29728	Detectives
29744	Detectives
29776	Detectives
32784	Organized Crime A
32800	Organized Crime B
32816	Organized Crime C
32832	Organized Crime D
32848	Organized Crime E
32864	Organized Crime F
32880	Organized Crime G
32896	Organized Crime H
32912	Organized Crime I
32928	Organized Crime J
32944	Organized Crime K
32960	Organized Crime L
32976	Organized Crime M
32992	Organized Crime N
33008	Organized Crime O
41056	Internal Affairs
41216	State Attorney's Office - Narcotics
41296	State Attorney's Office - Narcotics
45072	Marine Unit Primary
45088	Marine Unit Secondary

Chicago Fire Department

Much like the police department, the Chicago Fire Department is one of the oldest in the nation and is only second in size to that of New York City (FDNY). The department employs over 4,300 professional fire fighters who respond to the city's emergencies.

CFD uses an analog, conventional, VHF radio system.

Output	Input	CTCSS	Ch.	Description
154.1300	154.0100	156.7	1	Main (North)
153.7700	153.9500	156.7	2	Englewood (South)
154.2200		156.7	3	Administrative Simplex
153.8300		156.7	4	Fireground 1
154.2950		91.5		Fireground
154.2950				MABAS/Fireground Blue
154.3850		156.7	5	Command Simplex
158.8950		203.5		Command & Shops



154.3850	131.8	6	HAZMAT
153.8300	156.7	7	Mutual Aid Fireground
154.2650		8	Mutual Aid North
154.2650	210.7		Statewide Mutual Aid (MABAS)
154.2800		9	Mutual Aid South
154.2800			Fireground White (MABAS)
155.4000	250.3	10	MERCI North
155.3400	250.3	11	MERCI South
155.4750	CSQ	12	Nationwide Law Enforcement Emergency
155.0550	CSQ	13	Statewide Interagency Mutual Aid
155.0250	CSQ	14	EMA: Statewide Highband
156.6000	CSQ	15	Marine 12
156.8000	CSQ	16	Marine 16
157.1000	CSQ	17	Marine 22
157.1500	CSQ	18	Marine 23
156.4250	CSQ	19	Marine 68
158.8800	411 DPL	20	Water Department North
158.2500	412 DPL	21	Water Department South
162.5500	CSQ		National Weather Service (RX only)
153.7925			Fire
153.9275			Fire
153.9500			Fire
154.0100			Fire

Chicago EMS

Chicago's Emergency Medical Service provides basic and advanced life support emergency medical care to the citizens of Chicago.

Frequency	CTCSS	Ch.	Description
460.600	156.7	1	EMS North
460.625	156.7	2	EMS South
462.950	156.7	3	EMS
462.975	156.7	4	EMS Command
458.025	203.5	5	Special Events 5
458.075	210.7	6	Special Events 6
458.125	218.1	7	Special Events 7
458.175	225.7	8	Special Events 8
155.340		MERCI-1	MERCI-South: BLS Hospital to Ambulance Channel
155.400		MERCI-4	MERCI-North: BLS Hospital to Ambulance Channel
155.280	141.3		IDPH S/W Net Statewide Hospital Disaster Coordination
463.000		MED-1	Ambulance to Hospital Comms
463.025		MED-2	Ambulance to Hospital Comms
463.050		MED-3	Ambulance to Hospital Comms
463.075		MED-4	Ambulance to Hospital Comms
463.100		MED-5	Ambulance to Hospital Comms
463.125		MED-6	Ambulance to Hospital Comms
463.150		MED-7	Ambulance to Hospital Comms
463.175		MED-8	Ambulance to Hospital Comms

Cook County Suburbs

As we said at the start of this article, a comprehensive look at Chicagoland would take up much of this issue, leaving no room for articles of interest to those who enjoy shortwave, amateur radio, aviation, and the like. As a courtesy to them, we will only look at some of the consolidated dispatch centers located across Cook County.

As the name implies, a consolidated dispatch center handles calls for multiple agencies and jurisdictions. Many of the communities simply aren't busy enough to justify a full-time dispatcher and dedicated frequencies, so they pool their resources.

E-COM

E-Com dispatches for Flossmoor, Glenwood, Hazel Crest, Homewood, Riverdale, South Holland

Frequency	CTCSS	Description
470.9375	203.5	Police Dispatch
470.4750	D114	Police Secondary
155.6700	CSQ	Police Car to Car
153.8900	CSQ	Fire

NORCOMM

NorComm dispatches for several police and fire departments in the West Suburbs.

Frequency	CTCSS	Description
471.2375	146.2	Melrose Park PD
470.4125	192.8	Bellwood PD & Maywood PD
470.8250	192.8	Police Tac 17B
154.3700	103.5	Division 20 Dispatch (Northlake, Stone Park)
154.1750	146.2	Addison FD
153.5000	103.5	Alternate (repeats 150.775)

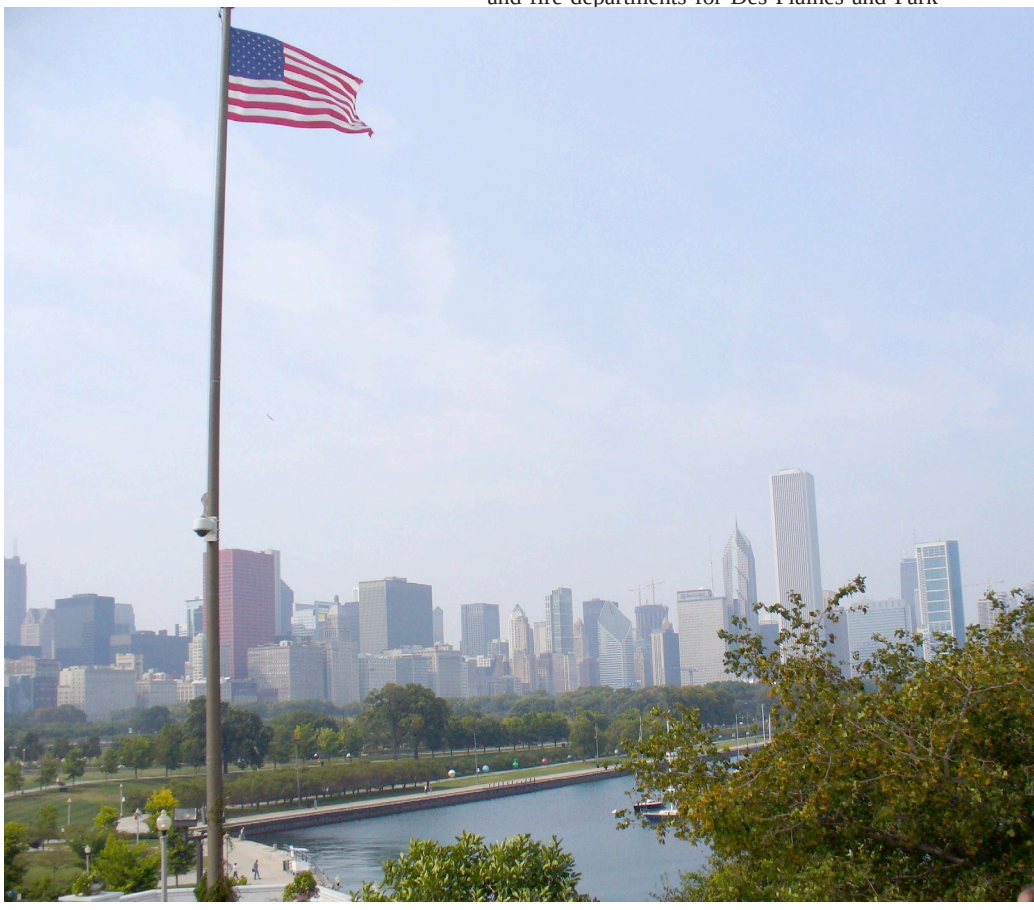
NORTH REGIONAL TELECOMMUNICATIONS NETWORK

North Regional Telecommunications Network dispatches for several agencies on the north side of Cook County.

Frequency	CTCSS	Ch.	Description
470.9625	192.8	1/2	APERN
470.3375	192.8	5	Tac 5
470.8375	192.8	6	Tac 6
470.7875	192.8		Skokie & Lincolnwood PD
470.7125	192.8		Niles & Morton Grove PD
470.7625	192.8		Glenview PD
470.6125	173.8		Northbrook PD
470.6625	192.8		Winnetka, Wilmette, Glencoe, Northfield, Kenilworth PD
470.6125	173.8		Northbrook PD Operations

NORTH SUBURBAN EMERGENCY DISPATCH CENTER (NSEDC)

North Suburban Emergency Dispatch Center is located at Des Plaines and dispatches police and fire departments for Des Plaines and Park



Ridge, as well as Niles and Morton Grove police departments.

Frequency	CTCSS	Description
155.7450	118.8	Des Plaines PD
470.4875	146.2	Park Ridge PD
470.7125	192.8	Niles & Morton Grove PD
154.3400	136.5	Des Plaines, Park Ridge FD

NORTHWEST CENTRAL DISPATCH

Northwest Central Dispatch handles dispatch for police and fire departments for communities in the northwestern part of Cook County. These communities are: Arlington Heights, Buffalo Grove, Elk Grove, Hoffman Estates, Mt. Prospect, Palatine Rural FPD, Palatine, Prospect Heights, and Streamwood. They use a Motorola Astro trunked radio system. Since this system is digital, your trunk tracking scanner will have to be able to demodulate APCO-25 signals.

Frequencies:
866.0875, 868.0750, 866.5375, 866.7875, 856.7125, 866.8375, 867.3125, 868.7500 MHz

Talkgroup	Description
176	Police - All-Talk 1
208	Police - All-Talk 2
240	Police - All-Talk 3
272	Police - All-Talk 4
304	PD-1 - (Mt. Prospect & Prospect Heights)
336	PD-2 - (Elk Grove & Palatine)
368	PD-3 - (Arlington Heights & Buffalo Grove)
400	PD-4
432	PD-Admin-1
464	PD-Admin-2
496	PD-Admin-3/Buffalo Grove Car-to-Car
528	Inv-1
560	Inv-2/Palatine PD Car-to-Car
592	Inv-3
624	Patrol-1 - Mt. Prospect PD Ch. 2
656	Patrol-2 - Elk Grove PD Ch. C
688	Patrol-3 - Arlington Heights PD Ch. 2
720	Patrol-4
752	PD-Tac-1
784	PD-Tac-2
816	PD-Tac-3
848	PD-Tac-4
880	Traffic-1
912	Traffic-2
944	Traffic-3
976	Traffic-4
1168	Prospect Heights PD Car-to-Car
1232	PD Admin 4
1264	PD Investigations 4
1360	Fire All-Talk 1
1392	Fire All-Talk 2
1424	Fire All-Talk 3
1456	Fire-1 (Elk Grove, Palatine, Palatine Rural)
1488	Fire-2 (Arlington Heights, Buffalo Grove, Mt. Prospect)
1520	Fire-3
1552	Arlington Heights Fireground
1584	Buffalo Grove Fireground
1616	Elk Grove Village Fireground
1648	Mt. Prospect Fireground
1680	Palatine Fireground
1712	Palatine Rural Fireground
1744	Fireground 7
1776	Fire Admin
1808	Fire Insp
1840	Fireground-1
1872	Fireground-2
1904	Fireground-3
1936	Fire Training 1
1968	Fire Training 2
2000	Fire Training 3
2032	Arlington Hts. Fireground-2
2064	Buffalo Grove Fireground-2
2096	Elk Grove Village Fireground-2
2128	Mt. Prospect Fireground-2
2160	Palatine Fireground-2
2192	Palatine Rural Fireground-2
2224	Fireground 8

Skyline from Navy Pier

ORLAND CENTRAL DISPATCH

Orland Central Dispatch handles fire department calls in the south and southwestern suburbs and includes the following agencies: Calumet City FD, East Joliet FPD, Homer Twp FPD, Mokena FPD, Orland FPD, Peotone FPD, and Romeoville FPD

Frequency	CTCSS	Description
159.0450	173.8	Dispatch
155.1675		Response
155.2725		Response
155.2125		Response
155.3025		Response
465.5750		Response

SOUTHCOM

SouthCom dispatches for Matteson, Olympia Fields and Richton Park.

Frequency	CTCSS	Description
470.7625	127.3	Police Dispatch
470.6125	127.3	Police MDTs
154.3700	162.2	Fire Dispatch
151.3325	D114	Fire Operations

SOUTHWEST CENTRAL DISPATCH

Southwest Central Dispatch (SWCD) dispatches several agencies in the southwest Cook County area.

Frequency	CTCSS	Description
470.8625	114.8	Chicago Ridge, Palos Heights, Palos Hills, Palos Park, Worth PD
476.7375	114.8	Burr Ridge, Clarendon Hills, Indian Head Park, Lemont, Willowbrook PD
155.1900	CSQ	Originally configured as a system-wide channel, it still sees limited use.
158.7450		Admin & Car-to-Car
155.1450		Admin & Car-to-Car
153.6350	146.2	Clarendon Hills FD
154.4300	91.5	Chicago Ridge, Roberts Park, Worth FD
154.0700	CSQ	Palos Hills, Palos Heights, Palos Park FD
154.4000	CSQ	Frankfort, New Lenox, Manhattan FD
154.2800	CSQ	South Suburban Fire Mutual Aid Network

WESTCOM

WestCom dispatches Police and Fire for Elmwood Park, Oak Park and River Forest.

Frequency	CTCSS	Description
154.845	162.2	Police Dispatch
159.120	D174	Fire Dispatch
154.190	D162	Fire Dispatch (Old)

We hope you enjoyed your visit to the Second City, Chicago, Illinois!

A Trailer for All Seasons

By Wayne Heinen N0POH
Photos Courtesy Rocky Mountain Ham

Rocky Mountain Ham has been a long time participant in VHF Contests, usually in June, from a variety of interesting sites in DM79, DN70 and DM89. These portable operations were traditionally conducted from the members' campers. What was really needed was a permanent home for their operation.

Since they decided to design their new home from the ground up, they created a trailer that can function as a mobile contest venue as well as a public service command center for the Amateur community.

Construction

It started out as an 8-foot wide, 16-foot long, 7-foot high Pace hauling trailer. The RMHAM crew, consisting of Scott Taylor W0KVA and John Maxwell N0WBW, began by furring out the walls with 2 X 3's. The ceiling was reinforced by adding half inch plywood between the ceiling skin and metal ceiling support beams of the trailer, then 2 X 3's were added to allow for structural stability, insulating and finishing of the ceiling. The addition of the plywood would support rooftop activity required for 10 GHz operation during contests and any antenna maintenance.

One inch foam insulation was installed in the walls and ceiling. Installation of a roof mounted RV type half ton air conditioner was a must, since the first major outing would be on the plains of Colorado for the 2006 June VHF QSO Party. It worked perfectly, cooling the trailer to meat-locker temperature even with four people and gear running.

Framing for the built-in operating desks

and overhead cabinets was installed next, providing for three operating positions. One operating position is located on the forward wall of the trailer, with the other two being located on the long wall opposite the entry door. The door, the roof vent and the 12 volt overhead light were the only items that actually came standard with the trailer.

Electronics

The operating position located on the forward wall was framed to include a cabinet 32 inches high eight inches deep and eight feet wide underneath. This is the power cabinet and contains the 50 amp breaker box for the AC power obtained from an outboard Honda EU3000is generator. In addition to the AC power, the coax bulkhead for the antennas and the 12 volt power supply system are housed in this compact area. Next to the power cabinet, a one foot by one foot chase was framed up to route the coax from the bulkhead vertically to the upper cabinets.

The AC distribution to each operating position supplies three 20 amp dedicated outlets as well as a 15 amp UPS outlet for the computers. This allows each position completely separate, reliable computer power.

DC power is obtained from a commercial 75A DC power supply through a custom-built distribution panel, breaker system and four sealed gel-cel batteries that are isolated from the system. The DC power reaches three operating positions using an eight gauge feed from the main distribution panel under the front desk for 12 volt equipment.

This is routed to Rigrunner™ DC distribution panels located in all the overhead cabinets and units mounted under each operating position. Each position is also wired with Ethernet, phone, grounding and rotor cables to make them fully functional for the contests, as well as providing the essentials for public service events.

The coax bulkhead provides 12 open N connectors on the outside of the trailer to accommodate a variety of antennas. Each operating position is fed with four runs of LMR-100 coax leading back to the bulkhead. The contest radios sit atop the rather ample desk space at each position; the positions and bands can be mixed and matched to accommodate the changing band assignments for the individual operators during the contest.

All the wiring was concealed in the walls and the overhead cabinets that were built at the ceiling level. The cabinetry was designed and built specifically to fit the needs of the trailer. After all the wiring was in place, the walls and ceiling were finished with hardboard which was covered with industrial type carpet. This provided more sound deadening and gives the trailer a finished look.

Lighting was installed next. Adjustable ceiling mounted track lighting was used; this lighting has inherent flexibility and can be moved and adjusted to the needs of anyone who might use any of the three positions. Another benefit of track lighting was discovered when the trailer was used at the Denver Marathon. With an outdoor temperature of 20 degrees, the lights raised the inside temperature and held it at 65 degrees within 2 hours. That meant that the Suburban RV forced air heater that we had installed for winter operating wasn't really needed.

After using the trailer in the June 2006 ARRL contest, a separate lighting circuit using lower illumination rope lighting was installed at the bottom of the overhead cabinetry over the operating positions. This improved nighttime operating visibility, especially when just reentering the trailer from the outside. The track lighting proved to be great in the daytime, but was too intense after dark.

The counter tops were fashioned from medium density fiberboard (MDF) with laminate tops and oak trim. Each operating position is equipped with a 17 inch LCD monitor which is attached to a separate Pentium4 computer mounted under each position. The cabinetry was finished off with "bead-board" and a few more built-in features were added. In order to monitor power usage, displays were mounted on an upper cabinet door located above the power cabinet for battery plant voltage, load and charge amps.

In the center of the long wall, they installed a Motorola Commercial UHF and Commercial VHF unit. These radios cover Amateur VHF/UHF FM, along with 150MHz and 450MHz Commercial and LTR trunking bands. This gave greater flexibility to the venue when working with outside agencies during public service events. There is also an Icom IC2100 High power VHF used with a KPC3 Plus attached to a Magellan GPS unit. This will be put on N0WBW-10 soon so they can find the trailer on FINDU!

Comm Trailer in Use

John reported on their findings after the first few outings of the completed trailer. "Here are a few things that we learned along the way. The air conditioner is a load for the generator. We did find out at the marathon that a laser printer is more of a load than the air conditioner, and it actually killed the generator! We'd recommend at least a 4500W generator to handle these loads successfully. 'Fact is, we acquired one and used it in our most recent deployment with Colorado ARES District 22."

This was an attempt to create a versatile trailer that would meet many needs from Amateur Radio needs ranging from contesting, emergencies and Public Service, as well as other non-amateur events, such as race timing. The trailer has seen action through providing the operating venue for Rocky Mountain Hams W0KVA contest station during the June VHF QSO Party in 2006, 2007, and 2008; and as the Operations Center for the 2006, 2007 and 2008 Denver Marathons. It also served as the command post for Arapahoe County ARES District 22 in support of Destination Imagination, the 2008 Bike-MS -Great West Bike Ride, 2008 Field Day, and support for the 2008 Arapahoe County Fair.

John N0WBW is an avid Corvette enthusiast, as well as an active amateur operator. The trailer has worked well for timing autocross races for his Corvette club, Down the Road Corvettes **www.downtheroadcorvettes.org**

ASK BOB

GENERAL QUESTIONS RELATED TO RADIO

Bob Grove, W8JHD
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Q. *Our local police and fire departments have now gone digital. Can you recommend a new scanner for me so I can resume monitoring their communications? (Arvids Emkalns, Elk Grove Village, IL)*

A. There are actually four issues to be resolved when communities "go digital." Not all digitized systems use all of the variations.

Trunking is a shared-frequency system in which a pool of several frequencies, usually in the 800 MHz spectrum, are assigned mutually to several different agencies within the licensee's administration. No one frequency is the exclusive property of any one agency so, as a frequency becomes available, the next user to press his/her mike button gets it. This avoids busy agencies having to wait their turn on a frequency, while a smaller agency has long periods of frequency disuse.

Spectrum refarming is the process of the FCC's reassigning lesser-used frequency bands to growing services.

Narrow-banding is the technology which restricts each signal to occupy a smaller width of spectrum so that more signals can be placed closer together.

Digitized voice refers to taking the analog sound as you hear it and transforming it into "bits" (computer lingo) which sounds like a hiss or buzz and must be transformed back again by the receiving station so it can be understood. Digitization is usually chosen for privacy, and federal law does not permit scanning receivers to decode private communications. So unless the digitization is the publicly-open P-25 system, you will not be able to decode digitized voice on any scanner.

Here is the information we unearthed about the system in use at Elk Grove Village:

Northwest Central Dispatch - NWCD P25 (Lake/Cook)
Location: Arlington Heights, IL
System Type: Motorola Type II SmartZone
System Voice: Analog and APCO-25 Common Air Interface

001 Primary 866.08750c 866.53750c 866.78750c 866.83750 867.31250 868.07500c 868.75000
101 Possible Nextel Replacements 851.08750 851.53750 851.83750 852.31250 853.07500 853.75000

This is a P16 Mixed mode system. Any of the digital scanners (no analog) made by Uniden and GRE will do the job.

Q. *How tall does a vertical receiving antenna have to be for 500 kHz-30 MHz reception? Do I need radials? It will be mounted on the top of a house trailer. (John A. Sullivan, Carlisle, IN)*

A. Unlike VHF/UHF receivers, the primary obstacle to reception at medium and shortwave is electrical interference, both natural (global lightning storms) and manmade (power lines and appliances). Thus, once the antenna is of adequate length to receive weak signals, plus noise that is greater than that generated by the receiver's own circuitry, no further increase is necessary.

Decades ago, the U.S. Coast Guard determined that a six-foot vertical was adequate to receive any of their HF communications. The AOR model SA-7000 ($199.95 from Grove Enterprises) vertical for continuous 30 kHz-2000 MHz reception is only 71 inches tall and it's in wide use with excellent results.

Experiments I did several years ago showed that a 20-ft vertical, made of two 10-ft sections of TV antenna mast and mounted alongside my house, provided excellent shortwave reception. Of course, this close to a dwelling, electrical interference becomes a factor.

Since your antenna position is atop a presumably-metal trailer, and the sources of interference are below it rather than aside it, where it would get maximum coupling to the interference, I'd say that a 10 foot whip would work just fine.

Keep in mind, however, that signal levels will be low, and S-meter readings will look low as well, but the interference levels will also be reduced proportionately, so you will still hear the same signals above the background noise as if you had a 20 foot antenna. And no, you don't need radials.

Q. *I have three questions regarding the use of active shortwave receiving antennas (Craig Champagne, Atlanta, GA):*

(1) Is the H800 Skymatch active whip, mounted indoors, a good choice?
(2) How does the AOR LA380 active loop antenna compare to the H800?
(3) If I run the receiver and active antenna on batteries, do I need a ground?

A. **(1)** We generally compare the H800's reception to a 100 foot dipole. Because of its efficiency, you might have to use an attenuator on small, shortwave portables (the "LOCAL" setting instead of "DX") to avoid strong-signal overload. On desktop receivers it's an excellent companion.

Naturally, it would work best mounted outside your home. Indoors it will pick up electrical interference from multiple sources, and will also be somewhat shielded from signals trying to get through the walls, wiring and metallized insulation.

You should place the H800 high (attic crawl space?), and away from electrical wiring and large metal surfaces. You can even mount it horizontally instead of vertically and probably won't notice much difference.

(2) The advantage of the LA380 is its directivity; it can be rotated to either reduce interference or enhance the incoming signal. Active whips like the H800 are, of course, non-directional, so they respond equally well to signals in any compass direction – and to noise and signal interference as well!

While the LA380 is more expensive, it does give that extra advantage to extract a weak signal from noise and interference used indoors, but it's not weatherproof for outdoor use. The H800 is designed for outdoor use.

(3) Absolutely not. In fact, it's possible that that your reception will be better on the battery power than on AC due to the elimination of conducted noise into the system from your AC line.

When powered by AC, a ground on the receiver may help reduce electrical interference, and it does provide some protection against electrical shock if something goes wrong in the AC power supply, but it does not increase received signal strength over received noise.

Q. *I hear ham operators on the HF ham bands saying things like, "You're five over nine in south Texas." Five over nine what? Most S-meters I see are marked "1 - 3 - 5 - 7 - 9 - 20 - 40." (Ken Roberts, email)*

A. Early radios of the 1930s often had green-glowing "seeing eye" tubes which indicated relative signal strengths of incoming signals. Hallicrafters first substituted an analog S-meter on their model SX-16 in 1937. It was calibrated 1-9 to correspond with the existing Morse code RST signal quality reporting system (Readability 1-5, Signal strength 1-9, Tone purity 1-9).

Later on, for conformity, an S9 signal was designated to be 50 microvolts, and each interval from 1 to 9 was specified as 6 decibels (dB) stronger. Signal levels above S9 were simply shown as additional decibels above S9. So your example of "five over nine" would be 5 dB above the S9 level.

Questions or tips sent to Ask Bob, c/o MT are printed in this column as space permits. Mail your questions along with a self-addressed stamped envelope in care of MT, or e-mail to bobgrove@monitoringtimes.com. (Please include your name and address.)

Ken Reitz, KS4ZR
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Santa's Helper's Little List of Radio Gifts

It's often said that it's better to give than receive, but the holiday season is a two-way street: you get to give *and* receive, so I'd like to offer this year's list for your gift-giving and receiving consideration. Sometimes it helps to assist family members who are often clueless about what you'd really like: radio-related things.

And, when it comes to giving gifts to friends or relatives, consider giving gifts that might encourage them to get started in the radio hobby. I've broken the list down into pricing categories to show that you don't have to spend a lot of money to enjoy this interesting hobby or encourage others to do so as well.

UNDER $100

The Gift of Radio

Everyone connected with the radio hobby knows that its ranks grow older each year. To keep the hobby alive it's necessary to bring new people in. That's done on several levels: through friends who share some of your enthusiasm for the hobby or through youngsters who might be as fascinated by the hobby as you were at that age.

Starting out as a shortwave listener or scanner monitor is often the gateway to expanded radio activities through amateur radio. So, to get a kid interested in the hobby of radio listening, consider a gift subscription of *Monitoring Times* to a niece or nephew or youngster in your neighborhood who has indicated an interest in the hobby. The wide range of topics covered in *MT* might kindle the same kind of wonder at a segment of the world of electronics outside of the personal computer that you discovered many years ago. (See page 76 for rates.)

And, since youngsters are already a part of the computer generation, the pdf version with live links and color pages would not only appeal most to the younger set, but it's also easy on your pocketbook – at only $19.95 a year *MT Express* represents a very cheap investment in the future of the hobby. Call **800-438-8155** or visit **http://www.grove-ent.com/MT.html** to subscribe to either format.

The Gift of a Radio

I've reviewed many shortwave radios over the last few years and I've found that the best entry into the world of shortwave listening is the Kaito KA-1103 (see my review in the April 2007 *MT* or online at **www.monitoringtimes.com**). You can give a friend or young person the entire world for just under $90 with this great little receiver. Everything they need to be able to listen to international shortwave broadcasts, amateur radio operators, pirate HF broadcasters, digital signals, beacons, slow-scan TV and more can be held in one hand with this little marvel.

Kaito's KA1103 once again makes it onto my best-picks list for the holiday. (Courtesy: Kaito Electronics)

Unlike so many other inexpensive radios that tune the shortwave bands, this is a serious radio. Its sensitivity, selectivity, 522-29,990 kHz continuous tuning range, sideband reception, built-in rechargeable batteries and external antenna connection, combine to take the frustration out of learning the ropes of HF and put the satisfaction in. The Kaito KA1103 is available from Grove Enterprises and other dealers (800-438-8155 or **www.grove-ent.com/KAITO1103.html**).

Best Two-way FRS/GMRS Hand-held Radios

I had the opportunity earlier this year to test more than a dozen FRS/GMRS hand-held two-way radio sets. The best of the lot were Midland Radio's GXT900 units, which tune all FRS/GMRS and NOAA Weather channels. It has the WeatherAlert feature and comes with VOX operated headset boom-mics, two way power, charging cradles and rechargeable battery packs.

Midland Radio's GXT900VP4 covers FRS/GMRS and NOAA WeatherRadio channels. You get two radios featuring VOX operated headset boom-mics, AC/DC adapters and charging cradles. (Courtesy: Midland Radio)

While this set is rated for 30 miles, that's only possible if you are on top of a mountain and your friend is a direct line-of-sight in a valley 30 miles away. Typically, you'll get no more than three miles from any hand-held FRS/GMRS set.

I found the audio on the Midland sets superior to all other brands. The boom-mics make these radios perfect for bicycle enthusiasts or any other activity where you want to talk to your friends and still use your hands. These sets feature 142 privacy codes which give you up to 3,144 channels, and if that's not enough you get voice scrambling too!

The retail price on these radios is $90/set. But, I found many places on-line that had them deeply discounted such as **www.beachaudio.com**, which had them for $65.99 plus shipping. You can phone your order as well at 877-804-0495.

Crosley's Beautiful Retro Radio

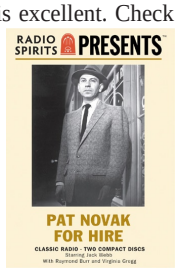
Most people can't afford a museum quality 1930's radio. But, for just under $100 you can get Crosley Radio's CR32CD (see my review in December 2007 *MT* and online) which gives a very faithful reproduction of the original Crosley 127 radio from 1932. But, it's even better: you get AM *and* FM reception as well as a built-in CD player. For some real fun, slip an old time radio CD into the CD tray, sit back and soak up the nostalgia.

Crosley's CR32CD is a versatile, attractive reproduction old-time radio.(Courtesy: Crosley Radio)

There are many dealers that carry Crosley radios or you can buy direct through Crosley at **www.crosleyradio.com** or call 866-CROSLEY. They also have a full-color catalog, which you can request on-line or by phone, that shows all of their tribute Crosley Radio products including telephones and jukeboxes, it's a lot of fun!

Spirit Radio's Spirit of Radio

OK, if you're going to give someone the gift of an old time radio, you have to give them the gift of old time radio programming from Radio Spirits. They have a catalog of hundreds of shows from the golden days of radio, ranging in price from $10-60 per set. These packaged sets are a little pricey, but the audio quality is excellent. Check out their offerings at **www.radiospirits.com**. You can order their catalog online or by phone at 203-265-8044 (this number is available Monday-Friday from 8:30 am to 8:00 pm ET).



There are many other on-line companies that carry

old time radio CDs, but Radio Spirits is the only one that has a hard-copy catalog and takes mail, online, and phone orders. The list of available programs is amazing and the audio reproduction will sound spectacular in the Crosley 32. Imagine the fun a youngster could have listening to these great shows and using their imagination to "see" the action.

UNDER $200

Useful Road Partner

The cheapest road insurance available is a CB radio. The 50 year-old technology of CB is still useful today, and the best CB set I tested (see *MT* August 2008 and online) was Cobra's 75WX-ST, a full-featured, hand-held unit that uses a remote mount and keeps all necessary controls right in your hand. What's more, this CB has a built-in NOAA WeatherRadio that keeps you abreast of developing weather conditions. Its compact size lets you easily stow it away from prying eyes and lets you take it from vehicle to vehicle with ease.

At $129.95 it may not be the cheapest CB set on the market, but I found it was the most versatile. This set was discounted to $94.99 at **www.buy.com** (with free shipping) as well as a number of other web-based retailers. Extra Cobra AC701 remote connectors can also be found at **www.buy.com** for $17.00 each, so you can easily switch vehicles, though you'll still need to buy a mag-mount CB antenna. Radio Shack is still one place you can buy mag-mount CB antennas and they're about $30. You can also order this CB set by phone from Buy.com at 800-800-0800.

HD Radio Bargain

One of the best table-top HD Radios made today comes from Cambridge Soundworks (CSW) and is the 820HD model. In my *MT* September 2007 review I called it "…a full-featured, beautifully designed, solidly built, HD Radio with unequalled audio." At the time, these radios were selling for $299.99. Now, at the company's web site, "open box" models can be found for $119.99 with free shipping.

This set makes a great bedroom clock radio and kitchen radio. Use it as a computer desk radio and hear what you've been missing from those chintzy computer speakers. There's an auxiliary input for computer audio or MP3 player, the fabulous CSW speakers do the rest. The best part is that it receives all the multicast channels available only through HD Radio transmissions.

Anyone in your family would be thrilled to find this under the tree with their name on it. You can order this radio on-line at **www.hifi.com** or by phone at 800-FOR-HIFI. But don't delay; these open-box models are available on a first-come-first-served basis. If you live outside a major metro area you'll need an external antenna to pick up the most HD stations.

UNDER $300

Hand-held GPS Receiver

Also this year I had the opportunity to test many of the latest hand-held GPS receivers. One of the best was the Lowrance iFinder Expedition C, a mid-range priced, hand-held GPS receiver that is extremely sensitive. I found that this receiver could pick up at least seven GPS satellites inside the house under a tree canopy. In the car it simply needed to be setting on the passenger seat or in a slot on the center console to get full reception.

The iFinder Expedition C features a built-in electronic compass and barometric altimeter with weather prediction icons. It also has a built-in high-capacity Secure Data (SD) card reader. The batteries are good for up to 16 hours and this receiver can be powered from an auto cigarette lighter (DC power adapter included). It can zoom in to show your location within a one mile range.

This could be just the thing for Direction Finding enthusiasts, hams on the move and anyone who enjoys outdoor activities. It's great for bicycling hams and geo-cachers, too.

The iFinder C has a built-in microphone for recording field notes and the SD card reader also plays MP3 audio files and has a full color display resolution of 320 x 240 pixels. This model usually retails at $299, but I found it at Limited Goods.com for $237.58 plus shipping. You can phone your order at 800-516-1549.

Loyd Van Horn, W4LVH
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Internet radio, through a radio!

I love Internet radio. I love being able to listen to radio stations all across the world. But I hate the hassle of trying to listen.

What hassle?

First, I am an audio geek, so I want my programming to sound good to my ears. The speakers on my laptop aren't that great, which means I have to dig through boxes of cables and connectors to find a patch cable to plug my laptop's audio into my home theater's input.

Meanwhile, I still have work that I need to be doing on my laptop, but because of the shortness of the patch cable, my laptop has to stay in this awkward location relative to the home theater receiver. It's a headache, to say the least. Often, I wished there was a solution that didn't have to sacrifice audio quality for convenience.

The emergence of the WiFi radio has offered that solution.

There are a growing number of models available, each with their own pluses and minuses. Some are strictly wireless only, some offer wired options for those with no wireless connections, others allow for an external audio source to be plugged into the unit (iPods, etc.) or feature a built-in radio tuner. The best solution will vary according to each listener's' needs.

Speaking for myself, audio quality is a top consideration, as all WiFi radios will do the job of tuning in Internet radio; it's what comes out of the speakers that I am concerned with. I want the most auditory bang for my buck.

Another important feature I look for is whether a WiFi radio will be able to handle my router's WEP security features. I also look for upgradability in the software/firmware of the model, as I want to make sure that, as more stations come on-line, I am not missing any of them.

So, if you have an audiophile on your holiday shopping list, consider bringing them into 21st century radio technology. Here are some of the major movers and shakers in the WiFi radio market. While each of them has different features, all of those listed here do have a few similarities. They all are capable of handling WEP/WPA wireless encryption standards and are compatible with at least a standard "G" wireless connection.

Sangean WFR-1 WiFi Internet Radio

Sangean outshines the rest of the competition with their WFR-1. Don't let the sticker price of $349.95 scare you off. This is much more than just a WiFi radio. The WFR-1 allows you to tune in standard local FM broadcasts with RDS (Radio Data Service), uses either a wired or wireless broadband connection, allows for uploading of digital music (.mp3), wireless streaming of audio

from your computer, and an auxiliary jack to plug an external audio source into the unit. You can even add your own favorite Internet radio stations and streaming scanner communications.

The sturdy wooden cabinet houses two high quality three-inch speakers, which will satisfy even the strictest of audiophiles. It even comes with a remote control for "from-the-recliner" tuning of worldwide radio! For those who don't need the built-in FM tuner, Sangean also offers the WFR-20 for about $299.95. Both radios can be ordered through Grove Enterprises: **www.grove-ent.com/page59.html** or call 800-438-8155.

Tangent Quattro

This was the unit that introduced me to the world of WiFi radio, as one of them graces the Van Horn household.

The Quattro is another of the big guns in the WiFi radio market, with many of the major features that one would expect from a top-of-the-line WiFi radio.

You don't have a wireless router? No problem, Quattro gives you an Ethernet direct connection option. What else? How about wireless streaming of audio direct from your computer, in better-than-average audio quality? Also, the ability to use the line-in jack to run audio from an external audio source through the unit, and its ease of use.

My only complaint is a lack of a remote control, but on a nightstand next to my bed, I don't need it. My first time sitting in front of a Quattro (and, indeed, any WiFi radio), I was able to navigate the dials and buttons with ease. I tuned in my first BBC Manchester morning show and I was hooked.

As with most WiFi radios, the built-in alarm clock is handy and a nice way to wake up with a new city every day. The price tag is a bit hefty ($350), but so is the radio.

As I mentioned before, audio is my top consideration, and the Quattro exceeds all expectations in this department. Consistently, the reviews I have read of this radio have given it nothing but praise over the competition in terms of audio quality. The bottom end is really heavy, giving the Quattros' sound a beefiness that many WiFi radios lack. **www.ccrane.com/radios/wifi-radios/tangent-quattro-wifi-internet-radio.aspx** or call 800-522-8863.

CC WiFi Radio

With a highly intuitive interface and small desktop footprint, the C Crane WiFi Radio is a great introduction to those who want to dabble their toes into the WiFi radio waters without drowning in the sticker price ($214) or skimping on features. The audio quality from the speakers is surprisingly good for its size.

A big plus for this radio is the inclusion of a remote control. This speaks to my inner slacker. Like some of the others, this radio supports either a wired or wireless broadband connection. **www.ccrane.com/radios/wifi-radios/cc-wifi-radio.aspx**

Revo Blik WiFi Internet Radio

Personally, I would have called this the "Stealth Radio" because it resembles a design straight from the Skunk Works playbook. A sleek modern design isn't all you get in an affordable ($189.95) package, though. The Blik is one of the only models in its price range to include Internet *and* FM radio in one unit.

It also has some of the other features the more expensive models bring to the table, including streaming of audio from a computer (it is both .mp3 and .wma compatible) and an external audio connection for routing audio from another source. The Blik also has an alarm clock and the handy remote control.

Some of the reviews of this radio have downplayed the Blik's audio quality, but stereo RCA outputs mean you can hook the Blik up to your home theater system and voila, problem solved. **www.ccrane.com/radios/wifi-radios/revo-blik-wifi-internet-radio.aspx**

Revo Pico Portable WiFi radio

What's that you say? You want to listen to Radio Luxemburg while taking a dip in the pool? Not a problem. Allow me to introduce you to the first portable WiFi radio.

Obviously, a wireless Internet connection is required for this model, but that's the whole point of having a portable WiFi radio. If you are located in a WiFi hot spot, you can tune in the world. This unit will keep us more than happy while we wait for production of the first WiFi "walkman."

The Revo Pico can run for eight hours on a two hour charge and comes with a handy remote control as well as a built in FM tuner. The price tag brings it in line with some of the upper-end units, but the convenience simply cannot be beat. This is true wireless Internet radio! **www.ccrane.com/radios/wifi-radios/revo-pico-portable-wifi-internet-radio.aspx**

Sangean WFT-1 WiFi Component Tuner

OK, so maybe this shouldn't be on the list, because it doesn't have a built-in speaker. But die-hard audiophiles with their own home theater system will definitely want to check this unit out. Plug this into one of your home theater's input channels and you have Internet radio through your existing system, no extra interface needed.

Initially, I was disappointed that no digital audio outputs existed, but then I remembered that none of these streams will be broadcasting in Dolby Digital 5.1 surround sound. The audio signal can either be sent flat, or can be customized using one of the unit's preset EQ settings.

An FM tuner and remote helps round out the package on this very professional and affordable (only $349) addition to any home theater system. This would be especially handy to those that have a home theater system set up with speakers in multiple rooms. Imagine, BBC2 in any room in the house, any time you wanted, anywhere in the world! **www.ccrane.com/radios/wifi-radios/sangean-wft-1-wifi-radio.aspx**

These are just a few of the WiFi radio solutions that are on the market now. The potential for growth in this market is wide open and very exciting. I have contemplated the day when a global broadband network exists and we have everything from handheld to in-car WiFi radios. With the rapid acceleration of technology, we may not be too far off.

As a matter of fact, technology is being implemented by Ford right now to utilize a Bluetooth connection to a cell phone's Internet connection to stream Internet radio through the car's stereo speakers. It seems kind of like going through the toes to get to the elbow, and it sounds like the audio quality would be understandably low, but at least it is being worked on. You can read more about those efforts here: **http://tuner2.blogspot.com/**

❖ New radio hobby hangs in the balance

With the great advances we have seen in the technology of Internet radio, we have seen virtually no progress in the debate over how song-writing royalties will be handled for Internet-only radio stations. Those of you who ever thought of putting up an Internet radio station or who have already done so and received communication from BMI or ASCAP asking for a check know what I am talking about.

Internet radio has the potential to become the next big radio hobby. Millions of us have the potential to create our own Internet radio station to "broadcast" whatever message or music we see fit. But as always, there are snags in the carpet.

One of the things that has held back the proliferation and expansion of in-home Internet radio stations is that the royalties and fees to be paid out to song publishing companies such as BMI and ASCAP can be pricey. Furthermore, efforts to come to a compromise in the money matter have been stalled by the National Association of Broadcasters, among others.

It is not surprising that broadcasters (and others) want to forestall any such compromises, since they might enable any Tom, Dick or Harry to start an Internet radio station and introduce a major influx of competition.

One of the major pushes we have seen in the past few years (which I witnessed first hand in my time with Clear Channel Radio) is for radio stations to bring their listeners to the Internet stream. One thing they have done very well is not only to offer the same audio signal you get terrestrially, but to incorporate interactive elements, direct links to advertisers' Web sites (which, as a former advertising salesman, I can tell, is worth its weight in gold), and other bonus content. Broadcasters know this is the next frontier in their survival, and they are terrified the product may be diluted through Internet radio originating from the general public.

The issues in sorting this out are far too complex to explain in the context of this column. But as we have seen countless times before, competition and the ingenuity of the amateur are often what drive and advance technology and industry. If the average hobbyist gets left out of the Internet radio dance, the advancement of the industry will suffer.

To clarify what's at stake, this isn't the same thing as somebody setting up a pirate radio station in their basement. The potential opportunity is even better. Instead of everyone on the block being able to hear your tiny little basement station, now the world can be your audience. Imagine the advancement of ideas, culture, and debate that could be brought forth by such an opening of Internet radio stations! Whereas terrestrial broadcasting required advanced engineering knowledge to operate a station, all you need to create an Internet radio station is an .mp3 playlist, a microphone and a Web address.

I look forward to seeing how all of this works out. I am sure that not everyone will get what they want in the deal, but hopefully, the little guy gets at least a fair shake. You can keep up with the latest developments in the ongoing royalty debate here: **www.kurthanson.com/**

Dan Veeneman
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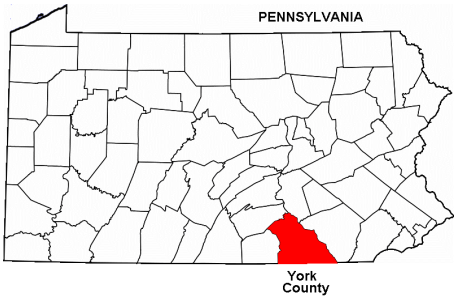
www.signalharbor.com

York County and P-25 Standards

Despite the advantages a new digital radio system can bring, the associated complexity can bring some unexpected surprises. This month we take a look at how some agencies are dealing with these difficulties and what it means for users. We also discuss a way scanner listeners might be able to help endangered wildlife.

❖ York County, Pennsylvania

By the time you read this, York County, Pennsylvania, should be operating on their new trunked radio system. Part of a $68 million technology overhaul, the radio system uses 22 repeater sites, each equipped with a hardened shelter and a generator for backup electrical power. The sites are connected via microwave *backhaul* links, carrying voice traffic to and from dispatch centers.



York County is located in south central Pennsylvania, on the Mason-Dixon border with Maryland, and covers about 900 square miles. It is home to just over 400,000 residents and is growing at more than 4 percent each year. The county provides dispatch services for 23 law enforcement agencies and 68 fire departments, and handled more than a quarter of a million calls for service last year.

The county's new radio system operates in the UHF band and follows the APCO (Association of Public Safety Communications Officials) Project 25 digital standards. The frequencies are taken from the spectrum previously allocated to UHF television channel 19. Television broadcasters and land mobile radio operators share the band from 470 MHz up to 512 MHz, with the Federal Communications Commission (FCC) making certain frequencies available in areas of the country where there is no local UHF television station. After the transition to digital television next year, even more of this spectrum should be open for additional public safety activity as broadcasters move to their new digital frequencies.

The York County system is actually divided into five smaller systems. Four of the systems, identified by the geographic area they cover, are *simulcast*, meaning the same information is simultaneously broadcast from multiple repeater sites. The fifth system operates from a single site and covers part of adjacent Lancaster County.

Central System:
500.3125, 500.3625, 500.5625, 500.6125, 500.7875, 500.8625, 501.0375, 501.1125, 501.2875, 501.3625, 501.5375, 501.6375, 501.7625, 501.8875 MHz
North System:
500.4875, 500.5375, 500.8125, 500.9125, 501.0625, 501.3125, 501.3375, 501.5625, 501.5875, 501.8125 MHz
South System:
500.3375, 500.4625, 500.5875, 500.7375, 500.8875, 500.9875, 501.1875, 501.2625, 501.4375, 501.4875 MHz
West System:
500.6375, 500.6875, 500.9375, 501.0875, 501.3875, 501.4625, 501.7375, 501.7875, 501.9375, 502.0375 MHz
Fulton System (in Lancaster County):
502.0125, 502.3625, 502.5375 MHz

In order to monitor these frequencies, most scanners will need an entry in a "Custom Frequency Table." This entry allows the scanner to properly scan the system in the UHF band. The values and talkgroups for the York County digital system are:

YORK COUNTY SYSTEM

Base	Spacing	Offset
500.000 MHz	12.5 kHz	0

Talk Groups

Decimal	Hex	Description
12001	2EE1	Fire (Dispatch)
12002	2EE2	Fire (Operations 1)
12003	2EE3	Fire (Operations 2)
12004	2EE4	Fire (Operations 3)
12005	2EE5	Fire (Operations 4)
12006	2EE6	Fire (Operations 5)
12007	2EE7	Fire (Operations 6)
12008	2EE8	Fire (Operations 7)
12009	2EE9	Fire (Operations 8)
12010	2EEA	Fire (Operations 9)
12011	2EEB	Fire (Operations 10)
12012	2EEC	Fire (Operations 11)
12013	2EED	Fire (Operations 12)
12014	2EEE	York Hospital (Channel 1)
12015	2EEF	York Hospital (Channel 2)
12016	2EF0	Memorial Hospital (Channel 1)
12017	2EF1	Memorial Hospital (Channel 2)
12018	2EF2	Hanover General Hospital (Channel 1)
12019	2EF3	Hanover General Hospital (Channel 2)
12020	2EF4	County Hazmat
12021	2EF5	County Hazmat
12022	2EF6	County Hazmat (Operations)
12023	2EF7	County Emergency Management (Channel 1)
12024	2EF8	County Emergency Management (Channel 2)
12030	2EFE	Advanced Technical Rescue
12031	2EFF	Advanced Technical Rescue (Tactical)
12032	2F00	Emergency Medical Service (Supervisors)
12033	2F01	County Fire Chief's Association
12034	2F02	Fire-Police (Channel 1)
12035	2F03	Fire-Police (Channel 2)
12036	2F04	Fire-Police (Channel 3)
12037	2F05	Fire-Police (Channel 4)
12038	2F06	Fire-Police (Channel 5)
12039	2F07	Fire-Police (Channel 6)
12040	2F08	City Fire Prevention
12041	2F09	City Fire (Inspectors)
12042	2F0A	City Fire (Maintenance)
12043	2F0B	City Fire (Supervisors)
12044	2F0C	City Emergency Management (Channel 1)
12045	2F0D	City Emergency Management (Channel 2)
12046	2F0E	Emergency Medical Service (Channel 1)
12047	2F0F	Emergency Medical Service (Channel 2)
12048	2F10	Emergency Medical Service (Channel 3)
12052	2F14	City Fire Operations
12049	2F11	Three Mile Island
12053	2F15	Emergency Medical Service (Channel 4)
12054	2F16	Emergency Medical Service (Dispatch)
12100	2F44	York City Police (Dispatch)
12101	2F45	York City Police (Tactical 1A)
12102	2F46	York City Police (Tactical 1B)
12103	2F47	York City Police (Tactical 1C)
12104	2F48	York City Police (Car-to-Car)
12190	2F9E	York City Police (Supervisors)
12105	2F49	Metropolitan Police (Dispatch)
12106	2F4A	Metropolitan Police (Tactical 2A)
12107	2F4B	Metropolitan Police (Tactical 2B)
12108	2F4C	Metropolitan Police (Tactical 2C)
12109	2F4D	Metropolitan Police (Car-to-Car)
12191	2F9F	Metropolitan Police (Supervisors)
12110	2F4E	North Police (Dispatch)
12111	2F4F	North Police (Tactical 3A)
12112	2F50	North Police (Tactical 3B)
12113	2F51	North Police (Tactical 3C)
12114	2F52	North Police (Car-to-Car)
12192	2FA0	North Police (Supervisors)
12115	2F53	East Police (Dispatch)
12116	2F54	East Police (Tactical 4A)
12117	2F55	East Police (Tactical 4B)

12118	2F56	East Police (Tactical 4C)
12119	2F57	East Police (Car-to-Car)
12193	2FA1	East Police (Supervisors)
12120	2F58	West Police (Dispatch)
12121	2F59	West Police (Tactical 5A)
12122	2F5A	West Police (Tactical 5B)
12123	2F5B	West Police (Tactical 5C)
12124	2F5C	West Police (Car-to-Car)
12194	2FA2	West Police Supervisors)
12125	2F5D	D/A (Dispatch)
12126	2F5E	D/A (Tactical 6A)
12127	2F5F	D/A (Tactical 6B)
12128	2F60	D/A (Tactical 6C)
12129	2F61	D/A (Car-to-Car)
12195	2FA3	D/A (Supervisors)
12130	2F62	Sheriff (Dispatch)
12131	2F63	Sheriff (Tactical 7A)
12132	2F64	Sheriff (Tactical 7B)
12133	2F65	Sheriff (Tactical 7C)
12134	2F66	Sheriff (Car-to-Car)
12196	2FA4	Sheriff (Supervisors)
12312	3018	Roundtop Ski Resort

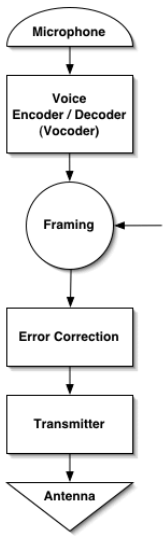
Voice Quality

This summer York County conducted a series of audio tests after concerns arose regarding the ability of digital radios to accurately carry a conversation in the presence of certain types of noise. Fire Departments across the country had been reporting difficulties with new digital radios when they were used in environments with high background noise.

The loud series of tones emitted by personal locator beacons, as used by trapped or injured firefighters to allow rescue personnel to reach them, were a particular cause of concern, since they effectively drowned out any conversation on the channel. Low air alarms from SCBA (Self-Contained Breathing Apparatus) were also a cause of interference.

Older analog radios transmit sound directly as it comes in from the microphone, with only enough filtering to pass the range of audio frequencies most common in speech. Because the range is continuous, background noise is typically carried through with little or no distortion. Dispatchers and other radio users are usually able to distinguish between background noise and the ongoing conversation.

Digital radios transmit sound in digital format. The sound from the microphone is converted from an analog signal to a series of binary digits (*bits*) in a device called a vocoder (voice encoder/decoder). These bits are then encoded and packed into frames and transmitted. Because physics limits the number of bits a radio channel is able to carry in a given amount of time (called *bit rate*), it is important that the vocoder be very efficient in the way it performs the conversion.



The goal is produce understandable speech with the fewest number of bits. Vocoder designers must make tradeoffs between voice quality and bit rate: the better the quality, the more bits it takes. Designers must also make assumptions about the sound they have to process, and generally optimize their vocoders to deal with human voice. Such vocoders, if tuned for maximum efficiency, often have difficulty accurately converting tones and other loud noises that are significantly different from normal human voices.

The vocoder specified by Project 25 is called Improved Multi-Band Excitation (IMBE) and was developed by a Massachusetts-based company called Digital Voice Systems, Inc. It is widely deployed and is used in a number of other digital radio networks outside of public safety. However, in certain sound environments – including those with particular kinds of loud background noises – the vocoder reacts poorly and is unable to accurately convert the human voice. This means that the dispatcher and other radio users will not be able to understand what the speaker is trying to say.

York County performed a series of audio tests with their new Model 5100 radios, sold by Tyco Electronics Wireless Systems. These tests were intended to determine what kinds of typical fireground noise, if any, could lead to audio problems and prevent firefighters from communicating safely and effectively.

A typical configuration is a microphone and antenna clipped to the left shoulder of the user, with a cord leading down to the hip-mounted radio. Users commonly speak in one of two ways, either tilting their head to the left and speaking across the microphone or unclipping the microphone and speaking directly into it.

The outcome of the tests resulted in a series of recommendations for users, most of which

boiled down to training. Users must be taught the proper way to use the radio in conjunction with their other firefighting equipment. A regular program must refresh this training and make it second nature for the users. The equipment must be used properly on a day-by-day basis, rather than waiting for an emergency before following established procedure.

In a noisy environment that has a high likelihood of creating problems, the user may be able to take steps to reduce background noise. Certain accessories could help, including throat and in-ear microphones that are less likely to pick up outside sounds. The user can turn away from the noise and use a free hand to shield the microphone.

Incident commanders must also be aware of potential noise problems and be ready to assign additional personnel to the task of communicating.

❖ Coast Guard and Project 25

I have a question. I am a member of the US Coast Guard Auxiliary and our District 13 US Coast Guard operates APCO-25 with Motorola systems. I believe they are Type II since they operate analog and digital, but I'm not sure. I know they utilize OTP (over the air programming). I want to know if other APCO-25 mobiles can utilize this type Motorola system or not. Any insight?

Ken in the Pacific Northwest

One of the goals of APCO's Project 25 (P-25) was to open up the radio equipment market to competition. Prior to P-25, most public safety radio systems in the United States used closed, proprietary equipment that locked customers into a single provider. Because the P-25 standards are available for everyone to see, it is possible for any manufacturer to design and build radios that follow the standard. The theory is that with everyone following the standard, the customer – in this case the Coast Guard – can select whichever radio manufacturer provides it with the best value, and is even able to mix and match equipment from multiple manufacturers.

Project 25 is actually a set of digital standards, where each standard covers a specific aspect of a digital radio network. One of these standards specifies how voice traffic is transmitted and is referred to as the Common Air Interface (CAI). Another standard details how P-25 trunking should be implemented. System operators may choose to use one, some, or all of the P-25 standards, with some limitations.

Because many agencies already own functional (and paid for) Motorola Type II systems and radios, a hybrid approach is available to help the transition to P-25 equipment. By using the old Motorola Type II signaling format on a 3,600-baud control channel, and adding the ability to handle CAI, a hybrid system can handle both analog and digital voice traffic.

So, there are three basic flavors of P-25 systems. The first is a non-trunked CAI, which is just a conventional frequency carrying digital voice. The second flavor is the hybrid, with both analog and digital voice on an old control channel. The third is a "pure" P-25, with CAI and a P-25 control channel, which is not compatible with analog voice or older control channel signaling.

The USCG Station at Bellingham, Washington, operates a repeater on 171.150 MHz that carries voice traffic in CAI. From what I understand, this frequency is not trunked, so any radio capable of supporting CAI should be able to operate over the repeater. A number of manufacturers produce radios that support CAI, including E.F. Johnson, Kenwood, ICOM, and others.

Do readers know of other Coast Guard repeaters that use APCO Project 25 standards? Are any of them trunked? Please send your reception reports to me at *danveeneman@monitoringtimes.com*.

❖ New York

As States struggle to deal with increasing budget deficits and dwindling tax revenues, New York is taking a hard look at the first stage of their planned Statewide Wireless Network (SWN). As we reported in earlier *Scanning Report* columns, the SWN was originally planned as a $2 billion network using OpenSky trunked radio equipment sold by M/A-COM. Initial testing of the system in Erie and Chautauqua counties in the western part of the State revealed 19 problems, including coverage gaps and equipment failures. M/A-COM was officially notified in August that they were in default of the terms of their contract and had 45 days to make corrections.

In October M/A-COM informed the state that they had taken a variety of steps to fix the 19 problems, including hardware upgrades and software fixes. The State scheduled testing for November and December 2008 and will issue a decision in the first part of 2009. If M/A-COM has not fixed the problems with the system, New York may choose to terminate their contract and find another provider.

New York has indicated they are committed to installing and operating a statewide radio network for public safety personnel, regardless of who the final equipment provider might be.

❖ Monitoring Wildlife

Much of the scanner activity covered in this column relates to public safety. Based on the mail that I receive, police and fire departments appear to be the main interest of most readers. However, there are many other interesting signals out there in the ether, and a few that can really be helpful to monitor.

If you live in the eastern part of the United States and have a scanner that covers 172 to 173 MHz, you could help scientists track an endangered species of bird. Researchers at the University of Guelph in Ontario, Canada, have placed radio tags on 20 young Eastern Loggerhead Shrikes and hope to track their fall migration from Ontario southward. Each year fewer and fewer birds return to Canada, so the scientists are trying to learn as much as they can about the bird's range and activities. You can read more about the Shrike and efforts to save it at **www.shrike.ca**.

Although scientists believe Florida may be their winter destination, it is possible that they stay further north, so residents of North Carolina, Tennessee, and states south may be able to help. By regularly tuning in to the following frequencies, you might be able to catch the short pulses from a tagged bird: 172.102, 172.172, 172.183, 172.208, 172.270, 172.283, 172.302, 172.329, 172.350, 172.402, 172.429, 172.483, 172.532, 172.553, 172.564, 172.623, 172.722, 172.763, 172.804 and 172.965 MHz.

The tags emit a signal with a ground range of about a mile, with a very short chirp occurring every second or so. Other signals may sound similar, so it is important to confirm that you're really hearing a tag. Details about the signal and the transmitter that generates it can be found on the World Wide Web at **www.homingin.com/joemoell/owl.html**, along with contact information and reporting instructions. The batteries on the Shrike tags probably won't last too far into December, so be sure to start scanning right away.

If you happen to miss the search this year, or you live too far west, be sure to check other links on the Homing In web site. Who knows? You may find a new purpose for your scanning sessions!

That's all for this month and this year. As always, send comments, corrections, new finds and tips to *danveeneman@monitoringtimes.com* and check my web site at **www.signalharbor.com** for more frequencies and scanner information. Until next month, have a Merry Christmas and a happy, peaceful New Year.

Big Savings on Radio Scanners

Uniden® SCANNERS

Bearcat® 796DGV Trunk Tracker IV with free scanner headset

Manufacturers suggested list price $799.95

CEI Special Price $519.95

1,000 Channels • 10 banks • CTCSS/DCS • S Meter
Size: 6 15/16" Wide x 6 9/16" Deep x 2 3/8" High

Frequency Coverage: 25.000-512.000 MHz., 806.000-956.000 MHz. (excluding the cellular & UHF TV band), 1,240.000-1,300.000 MHz.

When you buy your Bearcat 796DGV Trunktracker package deal from Communications Electronics, you get more. The GV means "Great Value." With your BC796DGV scanner purchase, you also get a **free deluxe scanner headphone** designed for home or race track use. Headset features independent volume controls and 3.5 mm gold right angle plug. The 1,000 channel Bearcat 796DGV is packed with features to track Motorola Type I/II/IIi Hybrid, EDACS, LTR Analog Trunk Systems and Motorola APCO 25 Phase I digital scanner including 9,600 Baud C4FM and CQPSK. Also features control channel only mode to allow you to automatically trunk many systems by simply programming the control channel, S.A.M.E. weather alert, full-frequency display and backlit controls, built-in CTCSS/DCS to assign analog and digital subaudible tone codes to a specific frequency in memory, PC Control and programming with RS232C 9 pin port (cable not supplied), Beep Alert, Record function, VFO control, menu-driven design, total channel control and much more. Our CEI package deal includes telescopic antenna, AC adapter, cigarette lighter cord, DC cord, mobile mounting bracket with screws, owner's manual, trunking frequency guide and one-year limited Uniden factory warranty. For maximum scanning enjoyment, order magnetic mount antenna part number ANTMMBNC for $29.95. For complete details, download the owners manual from the **www.usascan.com** web site. For fastest delivery, order on-line at www.usascan.com.

Bearcat® BCT8 Trunk Tracker III

Manufacturer suggested list price $299.95

CEI Special Price $169.95

250 Channels • 5 banks • PC Programmable
Size: 7.06" Wide x 6.10" Deep x 2.44" High

Frequency Coverage: 25.0000-54.0000 MHz., 108.0000-174,.0000 MHz., 400.0000-512.000. MHz., 806.0000-823.9950 MHz., 849.0125-868.9950 MHz., 894.0125-956.0000 MHz.

The Bearcat BCT8 scanner, licensed by NASCAR, is a superb preprogrammed 800 MHz trunked highway patrol system scanner. Featuring TrunkTracker III, PC Programming, 250 Channels with unique BearTracker warning system to alert you to activity on highway patrol link frequencies. Preprogrammed service searches makes finding interesting active frequencies even easier and include preprogrammed police, fire and emergency medical, news agency, weather, CB band, air band, railroad, marine band and department of transportation service searches. The BCT8 also has preprogrammed highway patrol alert frequencies by state to help you quickly find frequencies likely to be active when you are driving. The BCT8 includes AC adapter, DC power cable, cigarette lighter adapter plug, telescopic antenna, window mount antenna, owner's manual, one year limited Uniden warranty, frequency guide and free mobile mounting bracket. For maximum scanning enjoyment, also order the following optional accessories: External speaker **ESP20** with mounting bracket & 10 feet of cable with plug attached $19.95. Magnetic Mount mobile antenna **ANTMMBNC** for $29.95.

Bearcat® BCD396T Trunk Tracker IV

Suggested list price $799.95/**CEI price $519.95**

APCO 25 9,600 baud compact digital ready handheld TrunkTracker IV scanner featuring Fire Tone Out Paging, Close Call and Dynamically Allocated Channel Memory (up to 6,000 channels), SAME Weather Alert, CTCSS/DCS, Alpha Tagging. Size: 2.40" Wide x 1.22" Deep x 5.35" High

Frequency Coverage:
25.0000-512.0000 MHz., 764.0000-775.9875 MHz., 794.0000-823.9875 MHz., 849.0125-868.8765 MHz., 894.0125-956.000 MHz., 1240.0000 MHz.-1300.0000 MHz.

The handheld BCD396T scanner was designed for National Security/Emergency Preparedness (NS/EP) and homeland security use with new features such as **Fire Tone Out Decoder**. This feature lets you set the BCD396T to alert if your selected two-tone sequential paging tones are received. Ideal for on-call firefighters, emergency response staff and for activating individual scanners used for incident management and population attack warning. **Close Call Radio Frequency Capture** – Bearcat exclusive technology locks onto nearby radio transmissions, even if you haven't programmed anything into your scanner. Useful for intelligence agencies for use at events where you don't have advance notice or knowledge of the radio communications systems and assets you need to intercept. The BCD396T scanner is designed to track Motorola Type I, Type II, Hybrid, SMARTNET, PRIVACY PLUS, LTR and EDACS® analog trunking systems on any band. Now, follow UHF High Band, UHF 800/900 MHz trunked public safety and public service systems just as if conventional two-way communications were used. **Dynamically Allocated Channel Memory** - The BCD396T scanner's memory is organized so that it more closely matches how radio systems actually work. Organize channels any way you want, using Uniden's exclusive dynamic memory management system. 3,000 channels are typical but **over 6,000 channels are possible** depending on the scanner features used. You can also easily determine how much memory you have used and how much memory you have left. **Preprogrammed Systems** - The BCD396T is preprogrammed with over 400 channels covering police, fire and ambulance operations in the 25 most populated counties in the United States, plus the most popular digital systems. **3 AA NiMH or Alkaline battery operation and Charger** – 3 AA battery operation - The BCD396T includes 3 premium 2,300 mAH Nickel Metal Hydride AA batteries to give you the most economical power option available. You may also operate the BCD396D using 3 AA alkaline batteries. Unique Data Skip - Allows your scanner to skip unwanted data transmissions and reduces unwanted birdies. Memory Backup - If the battery completely discharges or if power is disconnected, the frequencies programmed in the BCD396T scanner are retained in memory. Manual Channel Access - Go directly to any channel. LCD Back Light - A blue LCD light remains on when the back light key is pressed. Autolight - Automatically turns the blue LCD backlight on when your scanner stops on a transmission. Battery Save - In manual mode, the BCD396T automatically reduces its power requirements to extend the battery's charge. Attenuator - Reduces the signal strength to help prevent signal overload. The BCD396T also works as a conventional scanner to continuously monitor many radio conversations even though the message is switching frequencies. The BCD396T comes with AC adapter, 3 AA nickel metal hydride batteries, belt clip, flexible rubber antenna, wrist strap, SMA/BNC adapter, RS232C cable, Trunk Tracker frequency guide, owner's manual and one year limited Uniden warranty. Not compatible with AGEIS, ASTRO or ESAS systems. Order on-line at www.usascan.com or call 1-800-USA-SCAN.

More Radio Products

Save even more on radio scanners when purchased directly from CEI. Price includes delivery in the continental USA excluding Alaska.

Bearcat 898T 500 channel Trunktracker III base/mobile	$209.95
Bearcat 796DGV 1,000 channel Trunktracker III base/mobile	$519.95
Bearcat BCD396T APCO 25 Digital scanner with Fire Tone Out	$519.95
Bearcat 246T up to 2,500 ch. Trunktracker III handheld scanner	$214.95
Bearcat Sportcat 230 alpha display handheld sports scanner	$184.95
Bearcat 278CLT 100 channel AM/FM/SAME WX alert scanner	$129.95
Bearcat 248CLT 50 channel base AM/FM/weather alert scanner	$104.95
Bearcat 92XLT 200 channel handheld scanner	$109.95
Bearcat 72XLT 100 channel handheld scanner	$99.95
Bearcat BR330T up to 2,500 ch. Trunktracker III with Tone out	$274.95
Bearcat BCT8 250 channel information mobile scanner	$169.95
Bearcat 350C 50 channel desktop/mobile scanner	$104.95
AOR AR16BQ Wide Band scanner with quick charger	$199.95
AOR AR3000AB Wide Band base/mobile receiver	$1,079.95
AOR AR5000A+3B Wide Band 10 KHz to 3 GHz receiver	$2,599.95
AOR AR8200 Mark IIIB Wide Band handheld scanner	$594.95
AOR AR8600 Mark II Wide Band receiver	$899.95
AOR AR-ONE Goverment/Export sales only 10 KHz-3 GHz.	$4,489.95
Scancat Gold For Windows Software	$99.95
Scancat Gold for Windows Surveillance Edition	$159.95

Bearcat® BC246T Trunk Tracker III

Suggested list price $399.95/**CEI price $214.95**

Compact professional handheld TrunkTracker III scanner featuring Close Call and Dynamically Allocated Channel Memory (up to 2,500 channels), SAME Weather Alert, CTCSS/DCS, Alpha Tagging. Size: 2.72" Wide x 1.26" Deep x 4.6" High

Frequency Coverage:
25.0000-54.0000 MHz., 108.0000-174.0000 MHz., 216.0000-224.9800 MHz., 400.0000-512.0000 MHz., 806.0000-823.9875 MHz., 849.0125-868.9875 MHz., 894.0125-956.000 MHz., 1240.0000 MHz.-1300.0000 MHz.

The handheld BC246T TrunkTracker scanner has so many features, we recommend you visit our web site at www.usascan.com and download the free owner's manual. Popular features include **Close Call Radio Frequency Capture** – Bearcat exclusive technology locks onto nearby radio transmissions, even if you haven't programmed anything into your scanner. **Dynamically Allocated Channel Memory** - Organize channels any way you want, using Uniden's exclusive dynamic memory management system. 1,600 channels are typical but **over 2,500 channels are possible** depending on the scanner features used. You can also easily determine how much memory is used. **Preprogrammed Service Search (10)** - Makes it easy to find interesting frequencies used by public safety, news media TV broadcast audio, Amateur (ham) radio, CB radio, Family Radio Service, special low power, railroad, aircraft, marine, racing and weather frequencies. **Quick Keys** - allow you to select systems and groups by pressing a single key. **Text Tagging** - Name each system, group, channel, talk group ID, custom search range, and S.A.M.E. group using 16 characters per name. **Memory Backup** - When power is lost or disconnected, your BC246T retains the frequencies that were programmed in memory. **Unique Data Skip** - Allows the BC246T to skip over unwanted data transmissions and birdies. **Attenuator** - You can set the BC246T attenuator to reduce the input strength of strong signals by about 18 dB. **Duplicate Frequency Alert** - Alerts you if you try to enter a duplicate name or frequency already stored in the scanner. **22 Bands** - with aircraft and 800 MHz. The BC246T comes with AC adapter, 2 AA 1,800 mAH nickel metal hydride batteries, belt clip, flexible rubber antenna, wrist strap, RS232C cable, Trunk Tracker frequency guide, owner's manual and one year limited Uniden warranty. For more fun, order our optional deluxe racing headset part **#HF24RS** for $29.95. Order now at www.usascan.com or call 1-800-USA-SCAN.

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East Pacific Aeronautical HF

Recently we wrote about the busy Major Air Route Areas (MWARA) used for air traffic control over the North Atlantic. As we saw, the primary system is still good old high-frequency (HF) radio, though satellites are also used. Various countries maintain large, impressive ground stations, or contract them out to the global reach of Aeronautical Radio, Incorporated (ARINC).

A similar, if more spread out, system exists in the Pacific Ocean. Since the Pacific is a much bigger ocean, there are a lot of stations serving it. Here, we'll concentrate on the United States stations in the East Pacific.

This region is under the responsibility of the US Federal Aviation Administration (FAA), and in particular the Oakland, California, Oceanic Flight Information Region (FIR). The name is a bit confusing, since Oakland FIR covers 18.7 million acres, or 9.7 per cent of the earth's surface. In fact, it's the biggest FIR in the world. It is divided into eight oceanic control sectors, stretching from the US West Coast up to the Aleutians, across to Russia, and out nearly to Japan and China. These handle 560 flights a day on 13 of the world's top 25 busiest routes.

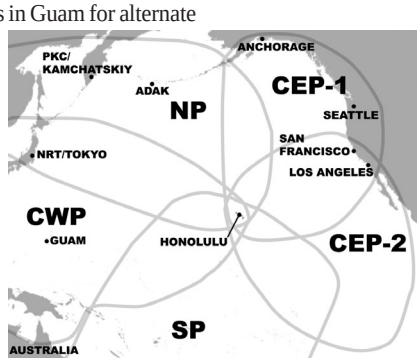
Radar control exists along the West Coast and around Hawaii. Everything else uses the international system of oceanic MWARA discussed last time.

❖ East Pacific Stations

As in the North Atlantic, these five MWARA regions have large overlaps. Unlike the North Atlantic, all of them radiate out from Hawaii, in a clever set of ellipses that resembles petals of a huge flower.

Two FAA stations serve these areas. One, San Francisco Radio, serves as the ground station for nearly all communication in the Oakland FIR. This is a huge station, maintained by ARINC, with major antenna farms in Northern California and a remote station in Barrow, AK, to work the polar route. Another remote station exists in Guam for alternate Long-Distance Operational Control (LDOC).

As one can imagine, this operation is rather complex. An informative map is the Jeppesen chart ARINC-4. A version that is obsolete for flight, but fine for our purposes, is always linked from the Download screen of ARINC's web site (**www.arinc.com/products/voice_data_comm/air_ground_radio_svc/jeppesen_charts/ARINC-4.pdf)**



Extended-range coverage is also provided along the California coast and around Hawaii on Very High Frequency (VHF). The main ARINC PacificNet frequency is 131.950 megahertz (MHz), often used by planes on the ground. They patch San Francisco to check in with the system and get their HF frequencies. On the coast north of Oregon, the frequency is 129.400 MHz.

The other station is Honolulu Radio, with several facilities in Hawaii. Air-ground traffic is only on VHF. The HF presence is VPAC, the Pacific aviation weather (VOLMET) broadcast. While schedules show FAA VOLMETs from Honolulu, San Francisco, and Anchorage, AK, these are actually all sent from Honolulu.

San Francisco Frequencies

All frequencies are upper sideband (USB) and in kilohertz (kHz). The route areas are as follows:

CENTRAL EAST PACIFIC (CEP) 1/2:
These areas cover the US and Canadian West Coast out to Hawaii. CEP-1 is from Alaska down to the Mexican border, and CEP-2 overlaps from around San Francisco down to 20 degrees south latitude. This makes all frequencies available on the busy run between California and Hawaii.
CEP-1: 3413.0, 3452.0, 5574.0, 6673.0, 8843.0, 10057.0, 13288.0, and 13354.0.
CEP-2: 2869.0, 5547.0, 11282.0, 13288.0, and 21964.0.

CENTRAL WEST PACIFIC (CWP):
This area covers the Central Pacific from Hawaii, out to Australia on the south and China on the north. CWP: 2998.0, 4666.0, 6532.0, 8903.0, 11384.0, 13300.0, 17904.0, and 21985.0.

NORTH PACIFIC (NP):
This busy area includes routes between the US and Japan. It considerably overlaps CWP on the south. NP: 2932.0, 5628.0, 5667.0, 6655.0, 8915.0, 8951.0, 10048.0, 11330.0, 13273.0, 13339.0, 17946.0, and 21925.0.

SOUTH PACIFIC (SP):
This interesting area starts around Hawaii and covers the entire South Pacific between 130 degrees west longitude at the east and the east coast of Australia on the west. It overlaps large portions of CWP and CEP-2. SP: 3467.0, 5643.0, 8867.0, 13261.0, and 17904.0.

SAN FRANCISCO LDOC:
LDOC is primarily a phone patch service. International regulations limit content to operational control matters. Patches are typically to company offices, though a medical consultation link and some other services are available.
San Francisco and the Barrow remote are: 3494.0, 6640.0, 11342.0, 13348.0, 17925.0, and 21964.0.
Guam remote facility (lightly used): 3494.0, 6637.0, 6640.0, 11342.0, 13333.0, 13348.0, and 17925.0.
As in the Atlantic, air-to-air communication uses the VHF frequency of 123.450 MHz ("one two three four five").

❖ Pacific VOLMET Frequencies

The Pacific VOLMET (VPAC) simulcasts 24/7 on the frequencies of 2863.0, 6679.0, 8828.0, and 13282.0 kHz USB. Content is weather observations, Significant Meteorological warnings (SIGMET), and Terminal Aerodrome Forecasts for certain major airports. These are in six 5-minute segments on a 30-minute cycle. They begin on the hour plus: 00/30: Honolulu; 05/35: San Francisco (via Honolulu); 10/40: Tokyo; 15/45: Hong Kong; 20/50: Auckland, New Zealand; 25/55: Anchorage (Honolulu).

❖ East Pacific Air Routing

The Oakland and Anchorage FIRs have three basic routing systems:

CEP Route System:
These are the seven very busy routes between California and Hawaii. They are numbered on the charts as R463, R464, R465, R585, R576, R577, and R578. As in the Atlantic, entry and exit is through designated waypoints (positions), with other waypoints along the way.

Pacific Organized Track System (PACOTS):
These work like the North Atlantic Tracks we have talked about. They lead from the United States (including Hawaii) to and from Japan, Hong Kong/Taiwan, and Manila. They change twice a day. Updates are published by Oakland and Fukuoka, Japan, in Notices to Airmen (NOTAMs). One place to see these is **https://pilotweb.nas.faa.gov/tracks/pTracks.html**

North Pacific (NOPAC) Route System:
This consists of five routes between Alaska and Japan, designated R220, R580, A590, R591, and G344.
Once making oceanic entry, aircraft follow standard international procedures for areas without radar service. Selcal (Selective Calling) is used so that radios are quiet between calls.

Have a nice holiday, and happy landings until next month.

UTILITY WORLD

UTILITY LOGS

Hugh Stegman

ABBREVIATIONS USED IN THIS COLUMN

AFB.....Air Force Base
ALE.....Automatic Link Establishment
AM .....Amplitude Modulation
AWACS .....Airborne Warning And Control System
CAMSLANT .....Communications Area Master Station, Atlantic
CAMSPAC .....Communications Area Master Station, Pacific
COTHEN.....Customs Over-The-Horizon Enforcement Network
CW.....On-off keyed "Continuous Wave" Morse telegraphy
E10.....Generic Israeli female phonetic calls and messages
EAM.....Emergency Action Message
FAX.....Radiofacsimile
FEMA.....US Federal Emergency Management Agency
HF-GCS .....High-Frequency Global Communication System
M08a.....Cuban 3-msg Morse, ANDUWRIGMT = 1-0
M22.....Israeli Navy, CW traffic and numbers
MARS.....Military Affiliate Radio System
MWARA .....Major World Air Route Area
MX.....Generic for Russian single-letter beacons/markers
NAT-x.....MWARA North Atlantic, family A-F
NOAA.....US National Oceanic and Atmospheric Administration
PR.....Puerto Rico
RDFT.....Redundant Digital File Transfer
RTTY .....Radio Teletype
Selcal.....Selective Calling
SHARES.....Shared Resources, US federal frequency pool
SITOR-B .....Simplex Telex Over Radio, mode B
SK01.....Generic for Cuban numbers in ham digital modes
UK.....United Kingdom
US .....United States
USAF .....US Air Force
USCG .....US Coast Guard
V02a.....Cuban "Atencion" Spanish numbers, 3-msg format

All transmissions are USB (upper sideband) unless otherwise indicated. All frequencies are in kHz (kilohertz) and all times are UTC (Coordinated Universal Time). "Numbers" stations have their ENIGMA (European Numbers Information Gathering and Monitoring Association) designators in ().

2872.0 Gander Radio-MWARA NAT-C, Canada, selcal check with Lufthansa 457, at 0350. (Allan Stern-FL)

2971.0 Gander Radio-MWARA NAT-D, working Virgin 76 at 0308. (Stern-FL)

3016.0 Reach 349-USAF Air Mobility Command, position check at 0540. (Patrice Privat-France)

3372.0 RHP86-Russian Navy, attempting CW contact with RJD99, also tried 4104 and 4556.5 kHz, at 2056. (MPJ-UK)

3455.0 Teal 71-USAF Reserve 53rd Weather Recon WC-130J "Hurricane Hunter" in hurricane Ike, signing with New York and back to satcom, at 0447. (Stern-FL)

3797.0 RCV-Russian Black Sea Fleet, Sevastopol, Ukraine, CW message to RIC87 at 1737. (ALF-Germany)

4331.0 4XZ-Israeli Navy (M22), CW marker, also on 6379, at 1906. (Ary Boender-Netherlands)

4396.0 WLO-Shipcom/Mobile Radio, AL, voice synthesized weather at 0817. (Tom Sevart-KS)

4469.0 Southeast CAP 43-US Civil Air Patrol, checking in Georgia CAP 49, Goldenrod 180, and Florida CAP 44, at 0000. (Mark Cleary-SC)

4471.5 MSN5-British Army 31st Signals Regiment, exchanging ALE messages in a poorly disciplined net, at 1847. (MPJ-UK)

4490.0 043NCS-US National Communications System, ALE sounding on SHARES Coordination Net Channel 3, at 0341. (Hugh Stegman-CA)

4557.9 "S"-Russian CW cluster beacon, Severomorsk, also 5153.9 and 7038.9, at 1908. (Boender-Netherlands)

4583.0 DDK2/DDH7/DDK9-German Weather Office, RTTY weather also on 7646, at 0035. (Gil Woodside-RI)

4880.0 ULX2-Israeli Intelligence, null-message callup (E10), at 2000. (Boender-Netherlands) ULX2 (E10), low modulation, at 2001 (Mike-West Sussex, UK)

4900.6 VES-USCG Cutter *Venturous* (WMEC 625) calling YWL (Cutter *Thetis*, WMEC 910), ALE, also on 6709, at 1931. (Cleary-SC)

5140.0 STATESEOC2-Probably Illinois State Emergency Operations Center, Springfield, calling D09IDOT, State Department of Transportation district 9, ALE at 1640. (Jack Metcalfe-KY)

5197.5 OPERACYJNY-Polish Kosovo Forces, calling BXPJANKOVIC (border checkpoint), ALE at 1955. (ALF-Germany)

5211.0 NYC2NG-NY National Guard, 2nd Weapons of Mass Destruction Civil Support Team (WMD-CST), working NJC21NG, 21st WMD-CST, NJ, ALE at 1748. (Metcalfe-KY)

5378.0 FC4FEM (FEMA Region 4, GA) calling AL4FEM (possibly Alabama), ALE at 0442. (Stegman-CA)

5435.0 ART-E10, callup and messages, parallel 6986, at 1932. (Boender-Netherlands)

5541.0 Cactus 722-USAir Boeing 757 (N205UW), patch via Stockholm Radio to Medlink regarding a sick passenger, at 0515. (Privat-France) *[USAir now using 'Cactus,' after merging with America West. -Hugh]*

5598.0 TGM091-TAG Aviation España BD-700 Global Express (EC-KJH), answered selcal KQ-BE from Santa Maria, handed to Madrid, at 0715. (Privat-France)

5616.0 Reach 758-USAF Air Mobility Command charter, getting the Jets football score from Gander (MWARA NAT-B), at 0010. Navy LC089-US Navy P-3C, position for Gander at 0149. Shanwick-Shannon Aeradio, Ireland, radio check with Gander for a suspected mike problem, at 0208. (Doug Bell-Canada)

5649.0 NATO 27-North Atlantic Treaty Organization E-3 AWACS, position for Gander (MWARA NAT-C), at 0147. (Bell-Canada)

5684.0 ADWNPR-USAF Non-Secure Internet Protocol Routing Network, Andrews AFB, working CRONPR (Croughton NIPRNET, UK), ALE and follow-on data at 0243. (Sevart-KS)

5696.0 Coast Guard 2118 (HU-25 Falcon/Guardian), setting guard with CAMSLANT at 2223. (Cleary-SC)

5708.0 510294-USAF KC-135R tanker, calling JNR (Puerto Rico HF-GCS, Salinas) ALE at 0050. (Cleary-SC)

5732.0 RESCUE 1719- USCG HC-130, possible Ike mission, patch via Service Center (COTHEN) to Clearwater Air, at 0120. (Cleary-SC) LNT-USCG CAMSLANT Chesapeake, ALE and voice checks with J23/ Juliet 23 (USCG helo), at 1203. (MDMonitor-MD)

5765.0 FAV22-French Morse training net, CW drill messages at 1421. (MPJ-UK)

5775.0 RCV-Russian Black Sea Fleet, working RIC87 at 1802. (ALF-Germany)

5787.5 RCH-US Army 1-228th Aviation, Honduras, calling WAROPS (Warrior Ops), ALE at 0559. (Cleary-SC)

5820.0 YHF-E10, callup and messages, also on 7918, at 1932. (Boender-Netherlands)

5898.0 V2a, 5-figure group message in progress, AM at 0834. (Sevart-KS)

6323.2 IDR-Italian Navy, Rome, data link coordination with BG (IABG, Patrol Boat *Commandante Bettica*), at 2100. (ALF-Germany)

6362.0 MGJ-UK Royal Navy, RTTY marker at 1409. (MPJ-UK)

6391.5 AQP4-Pakistan Navy, Karachi, CW marker at 2035. (MPJ-UK)

6396.0 9HD-Globe Wireless, Malta, Globedata idler identified by header byte, at 1927. (MPJ-UK)

6470.0 UWS3-Kiev Radio, Ukraine, CW traffic, also mentioned frequencies 3890 and 8571, at 1933. (MPJ-UK)

6586.0 New York Radio, clearing Speedbird 252 to London Heathrow, at 0209. New York, passing San Juan, PR frequencies to Continental 31, at 0509. (Stern-FL)

6640.0 New York Radio, sending Teal 70, a "Hurricane Hunter" in Kyle, to 8918, secondary 6586, at 0404. (Stern-FL)

6697.0 Exterior-US Strategic Command, with EAM, also using 8776, at 0130. (Cleary-SC)

6755.0 Mash 62-USAF Reserve KC-135R tanker, selcal check with New York at 2208. (Doug Bell-Canada)

6840.0 EZI-E10, also on 9130, at 1904. (Boender-Netherlands)

6855.0 V02a, AM callups 70212-74612-58471 and 16512 03411 26332, both repeats of previous hour on 7887, at 2100

(Cam Castillo-Panama)

6910.0 NNN0VDG-US Navy/Marine Corps MARS, FL, SHARES Region 4 and Region 6 Hurricane Net with several MARS stations, at 2331. (Cleary-SC)

7026.0 SAPPERTOC-Unknown military, ALE with SAPPERNET, GECKOTOC, FIGHTERTOC, and RENEGADETOC, at 2233. (ALF-Germany)

7038.7 "D"-Russian CW cluster beacon, Sevastopol, also 8494.7, 10871.7, and 13527.7, at 1908. (Boender-Netherlands)

7450.0 REBOM1-Petroleos Mexicanos, Rebombeo, calling AKALN1 (Akal field, platform N1), ALE at 0230. (MDMonitor-MD)

7527.0 LGV-USCG Cutter *Legare* (WMEC 912), calling HNC, Cutter *Harriet Lane* (WMEC 903) ALE at 1310. (MDMonitor-MD)

7540.0 AFA2QG-USAF MARS, controlling Transcon Digital Net in Multi-Frequency-Shift Keying, at 0001. (Woodside-RI)

7664.0 RIW-Russian Navy, Moscow, CW traffic for RJQ84, at 2350. (ALF-Germany)

7690.0 EZI2-E10, null-message callup at 2000. (Boender-Netherlands)

7887.0 V2a, AM callup 16512 03411 26332, at 2000. (Castillo-Panama)

8047.0 R23555-US Army helo, calling T3Z238 (3-238th Aviation), ALE at 0159. (Cleary-SC)

8097.0 M8a, 5-figure group CW message in progress at 1814, repeated at 1900. (Sevart-KS)

8156.0 Coral Harbour Base-Royal Bahamas Defence Forces, working unknown vessel at 1128. (Cleary-SC)

8301.6 Sector San Juan-USCG, PR, working Coast Guard 6523 (MH-65C helo), at 2256. (Cleary-SC)

8416.5 NMC-USCG CAMSPAC, SITOR-B frequencies and schedule at 0016. (Sevart-KS)

8495.0 "C"-Russian CW cluster beacon, Moscow, also 10872 and 13528, at 2039. (Boender-Netherlands)

8825.0 Iberia 6500-Iberia Airlines A320, altitude request with Gander (MWARA NAT-E), at 0037. (Bell-Canada)

8864.0 JESSE 91-Missouri Air National Guard C-130H, working Gander (NAT-B), at 1510. Canforce 4125-Canadian Forces CC-150, position for Gander at 1814. (Bell-Canada)

8891.0 Korean Air 082-Boeing 747, position for Gander (NAT-D), at 0031. Icelandic Radio, oceanic clearance for Air France 049, at 0031. (Bell-Canada)

8906.0 Springbok 208-South African Airways A340 (ZS-SNC), selcal check MS-CK with New York (NAT-A), at 0130. (Bell-Canada)

8912.0 RDC-USCG Cutter *Campbell* (WMEC 909), ALE sounding at 0027. (Cleary-SC) T74-US Customs Beech A200, ALE sounding at 2130. (MDMonitor-MD)

8918.0 Teal 76-USAF Reserve "Hurricane Hunter" on Hanna, position for New York at 1755. NOAA 49-Gulfstream G-IV on Hanna research, position for New York at 1805. (Bell-Canada)

8942.0 Singapore Radio, working unknown "879" at 1626. (Peter Poelstra-Netherlands)

8971.0 Fiddle-US Navy, FL, clear and secure with P-3C Pelican, at 2051. (Cleary-SC)

8983.0 CAMSLANT-USCG, working Coast Guard 2127, an HU-25A en route to the disabled Cypriot-registry bulk carrier *Atalina* in hurricane Ike, at 1543. CG 2127, telling CAMSLANT they have located the vessel, at 1550. (Stern-FL) *[484-foot vessel limped into Texas after the storm, with all hands safe. -Hugh]* CAMSLANT, position check with Coast Guard 2105, a HU-25D, at 2302. (MDMonitor-MD)

8992.0 Yankee 316-US Marine Corps KC-130T, radio check with Offutt HF-GCS, at 2141. (Cleary-SC) Navy LA 052-US Navy P-3C, patch via Andrews HF-GCS at 2330. (Bell-Canada)

9007.0 Rescue 05-Unknown aircraft working Trenton Military, Canada, at 0109. (Cleary-SC)

9025.0 NW1-US military airborne command post Nightwatch 1, raised ADW (Andrews AFB) in ALE, then voice comm check using a tactical call, at 1933. (MDMonitor-MD)

9112.0 M8a, 5-figure group CW message in progress at 1005. (Sevart-KS)

9202.0 YHF2-E10 null-message format, callup only at 2002. (Mike-UK)

10202.0 T9ACBP-US Customs & Border Protection aircraft, calling CRB, Customs Caribbean Regional Node, ALE at 2300. (Metcalfe-KY)

10242.0 YWL-USCG Cutter *Thetis* (WMEC 910), ALE sounding at 1132. (Cleary-SC)

10445.0 M8a, 5-figure group CW message in progress at 0303. (Sevart-KS)

10672.0 RDL-Russian Military, frequency-shifted Morse strategic broadcast at 1230. (MPJ-UK)

10780.0 Cape Radio-USAF, Cape Canaveral Air Force Station, FL, radio checks with PR 870, a US Navy EP-3E Aries II "World Watcher," given secondary of 20390, at 1959. (Stern-FL)

10993.6 Shark 10 (USCG Cutter *Thetis*), working Shark 13 regarding meeting Shark 41, at 0203. (Cleary-SC)

11000.0 RIW-Russian Navy, Moscow, calling RGZ58, CW at 0828. (Poelstra-Netherlands)

11175.0 Lajes-USAF HF-GCS, Azores, patching Reserve tanker Blue 62 to Pack Command Post (Pease Air National Guard Station, NH), at 1602. PAT 534-US Army Priority Air Transport, attempted patch via Andrews, at 2138. (Stern-FL) Tuff 10-USAF B-52H, radio check with Andrews at 1721. (Bell-Canada) Andrews, long 212-character EAM at 1845. (Sevart-KS) Teal 73-USAF Reserve "Hurricane Hunter" in Ike, patch via Offutt HF-GCS to the National Hurricane Center, FL, reporting a computer comm failure at 2030. (MDMonitor-MD) McClellan HF-GCS, CA, repeating two Andrews EAMs at 2206. (Jeff Haverlah-TX)

11205.0 Smasher-US Joint Task Force, FL, working Shark 80 at 0019. (Cleary-SC)

11226.0 OFF-USAF Offutt HF-GCS, calling helo R23573, ALE at 0200. (Cleary-SC)

11232.0 KING 21-US Air National Guard rescue HC130P, patch via Trenton Military for weather, at 0203. Peach 24-USAF E-8C, patch via Trenton to Peachtree Ops, GA, at 2050. (Bell-Canada) Trenton Military-Canadian Forces, patching Canforce 2680 to ground for arrival weather and customs arrangements, at 2325. (Stern-FL)

11330.0 New York, position check with NOAA 42, a hurricane WP-3D working Ike in the Caribbean, at 1536. New York, position check with WP-3D NOAA 49 on Ike, at 1925 and 1959. (Stern-FL)

11485.0 119CDCS05-US Centers For Disease Control, AR, calling partial address CDCS05, ALE at 2045. (MDMonitor-MD)

11494.0 MR1-Unknown COTHEN land-mobile unit, ALE sounding at 1435. (MDMonitor-MD) USDAEOC2-US Dept. of Agriculture Alternate Emergency Operations Center, MD, ALE sounding at 2306. (Stegman-CA) *[Not COTHEN, but a common frequency. -Hugh]*

11506.0 LCR154-Janki Comm Centre, Poland, ALE and voice with SPI, at 0902. (Poelstra-Netherlands)

12235.0 P50-Indonesian Navy, Belewan, CW markers and Indonesian traffic, at 1200. (Poelstra-Netherlands)

12631.0 KSM-Maritime Radio Historical Society, CA, 100% copy of SITOR-B news, at 2140. (Woodside-RI)

12993.0 KSM, CW weather at 2152. (Woodside-RI)

13152.0 WLO-Shipcom/Mobile Radio, AL, weather at 2305. (Cleary-SC)

13153.4 9MG-Globe Wireless, Malta, Globedata idler at 1517. (Poelstra-Netherlands)

13306.0 Air France 474-Boeing 747, oceanic exit confirmation with New York, at 1059. (Bell-Canada)

13927.0 Teal 73-USAF Reserve "Hurricane Hunter" in Ike, still having the computer problem reported on 11175, patch via AFA2HS (USAF MARS, KS) to the National Hurricane Center to pass data in VORTEX weather format, at 2120. (Stern-FL) *[Wow, just like old times! Very nice catch. -Hugh]*

13988.5 JMH4-Tokyo Radio, FAX tropical cyclone chart at 1350. (Poelstra-Netherlands)

14325.0 WA5NNO-Amateur, TX, working a vessel off FL in the Hurricane Watch Net, at 0050. (Cleary-SC)

14776.0 FC6-FEMA Region 6, TX, calling KS7FMA (Kansas State Emergency Operations Center), ALE at 1500. (MDMonitor-MD)

15767.0 720-USCG 1720, an HC-130H, ALE sounding at 1830. (MDMonitor-MD)

17435.0 V2a, AM callup 65313 47771 10571 and messages at 1700. (Sevart-KS)

17436.0 Cuban RDFT (SK01) in AM, passed file 34723342.txt at 1600, repeated on 16178 at 1630. (Sevart-KS)

17515.0 V2a, low modulation inaudible at times, then finally got louder in the middle of the transmission, at 1600. (Sevart-KS)

20390.0 Cape Radio-USAF, FL, came from 10780 for a radio check with EP-3E PR 870, at 2000. (Stern-FL)

Mike Chace
mikechace@monitoringtimes.com
www.chace-ortiz.org/umc

Getting Going with ALE

With the amount of coverage of Automatic Link Establishment (ALE) networks and the sheer level of activity, I receive a fair number of requests for information on how to receive these common signals.

Nowadays, all sorts of government, military, diplomatic, commercial and even amateur radio linking and networking is done with the most common form of ALE, that conforming to MIL-STD-188-141A, also sometimes known as 2G ALE.

So let's have a look at what you'll need to get going in this fascinating world of digital utility listening.

❖ The Radio

ALE is quite forgiving in the receiver department. No special or costly gear is needed. As long as the radio has single sideband (preferably both, but USB is by far the most common), is stable, can tune in 1kHz steps (though 100Hz is better), is well calibrated in terms of frequency, and has a bandwidth of at least 3kHz, you are in business. Indeed, I've successfully monitored ALE signals with inexpensive Kaito and Grundig receivers with very rudimentary digital readouts.

Finally, you'll need a way of getting the receive audio from your radio into your decoder hardware or software. The best way is via a jack that provides a constant level of audio: a so-called line out. If you don't have this on your radio, you can carefully adjust the audio from the headphone jack or pad it down with a resistor network to provide lower level for the input to a soundcard.

Remember that most signals are in USB and are on a whole kHz point, with some preferring a 0.5kHz offset. If you ever come across one that tunes out at 0.7kHz offset, you are almost certainly listening to the wrong sideband, though decode is unaffected. Switch to the lower sideband, and a few kHz higher you will find the LSB signal on a whole kilohertz point.

❖ The Computer

Since the majority of decoding options these days are implemented in software and use the standard computer soundcard, the requirements for the computing side are also modest.

These days, there is more than enough computing horsepower in the cheapest laptop or desktop to get going on ALE. My recently deceased vintage 1998 300MHz Pentium machine with 128Mb of RAM, a 20Mb disk, and Windows 98 did fine running most of the software options we'll cover in the next section.

Since we're not all fans of the products of a certain software company based in Redmond, WA, you'll be happy to know that there is a good option on the Mac OS X platform, too.

❖ The Decoder

As you might expect for such a widespread digital mode, there are plenty of options in the ALE software decoder department.

Provided you have a suitable computer, there are a number of programs that use the machine's soundcard to decode the ALE signals from the radio.

At the top of the cost range are the semiprofessional suites from Hoka and Wavecom. The Hoka also allows decoding of ALE in one window while decoding other signals (e.g. a MIL-188-110A high-speed modem) triggered by the ALE. Even the least expensive option from either manufacturer will set you back several thousand dollars. Both manufacturers require MS Windows operating systems.

In the more affordable cost range, again on Windows OS, is Skysweeper, whose cheapest ALE-decoding version is the Standard at GBP60 (about $105 at the time of writing). For Apple Mac users, we have the excellent MultiMode which supports ALE at the $89 mark.

In the new entrant department, there is MultiPSK, from French radio amateur Patrick F6CTE. This program supports not just the regular 141A-type ALE, but also an alternative narrowband version developed by Patrick called ARQ400. MultiPSK is also free and supports many more amateur radio digital modes, too.

Last, but not least, is the venerable PC-ALE software package that started it all, from another radio amateur Charles Brain G4GUO. Graciously, Charles put his software on the web for free, and it practically lit the utility listening community afire overnight with ALE fever.

❖ Putting It into Practice

After you've hooked up the radio to the soundcard and installed your chosen software, it's time to fire it all up and try it out.

The best approach is to try a few active frequencies with reliable, strong signals. A good start is the US Air Force HF ALE network which operates on a number of globally available frequencies. Choose one of the following frequencies based on the time of day and your local conditions:

2805, 3059, 3068, 3137, 4490, 4721, 4724, 5684, 5708, 6685, 6715, 6721, 6761, 7632, 7840, 8965, 8992, 9019, 9025, 9026, 9027, 9057, 11175, 11226, 11250, 13209, 13215, 15016, 15043, 18000, 18003, 20031, 20631, 23337, 27870 kHz USB

Within a few minutes you'll probably be greeted by the familiar gurgling sound of the ALE signal which will last a few seconds and cease. If all is well, your screen should start to fill with traffic like this which shows two soundings from stations with IDs JDG and HAW:

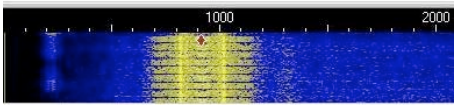
[THIS WAS] JDG
[THIS WAS] HAW

If you're not getting any results, here are a few things to do. Firstly, experiment with the audio levels. Most of these decoders have a way of telling you when they have the correct level. Too little audio (no copy) and too much (distortion spoils a perfectly good signal) can be a problem.

If you are using PC-ALE, each of the 8 tones that make up the ALE signal are shown on a small real-time audio spectrum with bars that are green, yellow or red, based on a well-tuned input signal. Keep the bars green.

If you are using MultiMode on the Mac, switch to the FFT mode and make sure that you are getting a clean trace with some red on the peaks of each tone and not a completely red screen (too much audio) or completely light blue screen (too little audio).

On a PC, you can also install the free DigiPan whose waterfall spectrum will not only tell you if you have the right levels using colors, but will also help ensure that you are right on frequency. You can do this by simply clicking the part of the signal of interest and reading the frequency off the scale. The ALE signal is correctly tuned when the halfway point between tones 4 and 5 is at 1625Hz.



❖ Caught the bug?

Digging around in the pages of this column, as well as Hugh's logs, will open you to a world of more exotic ALE listening. There are also hundreds of logs posted daily to the UDXF group on Yahoo Groups.

Many of the ALE networks that have been studied well in terms of habits, IDs, follow-on traffic and frequencies have yet to be conclusively identified, so there's always room for more help and detective work.

Also check out my own database with many profiles of the more common networks and thousands of ALE identifiers and frequencies at Utility Monitoring Central.

RESOURCES

MultiPSK - **f6cte.free.fr/index_anglais.htm**
Skysweeper - **www.pervisell.com/ham/skysweeper/index.html**
DigiPan - **www.digipan.net**
ALE Networks - **www.chace-ortiz.org/umc/alenets.html**
ALE Database - **www.chace-ortiz.org/umc/identa.html**
UDXF - **groups.yahoo.com/group/udxf**

GLOBAL FORUM

THE WORLD OF SHORTWAVE BROADCASTING

Glenn Hauser
P.O. Box 1684-MT, Enid, OK 73702
glennhauser@monitoringtimes.com
www.worldofradio.com

Less English from Sweden, Canada, Taiwan

On September 21, Radio Sweden relays via Canada at 1300 in Swedish, 1430 in English abruptly changed from 15240 to 11640, which was heard just as well. Finally the RS webpage explained:

"Following a technical fault at one of RCI's transmitter antennas at Sackville, a new antenna has been set up, but our transmissions are now on a new frequency."

We were expecting 15240 to resume in B-08, but instead, all the morning broadcasts to NAm were canceled! So no more R. Sweden with breakfast, when we often listened, never in the evening, which George Wood announced would continue via Canada at 0230 and 0330 on 6010.

On *The Link*, as heard by Mark Schiefelbein, MO, reporting to *WORLD OF RADIO*, Marc Montgomery said RCI would no longer broadcast on SW to Europe after the A-08 season.

Bill Westenhaver, RCI Audience Relations, confirmed to Kraig Krist, *DX LISTENING DIGEST*, that English and French are off, but Russian and Ukrainian remain, as do English and French to other targets. This closure to Europe is sure not to be the last act, I'm afraid, says John Figliozzi, NY.

RCI English is still to Africa at 1800-1900 via Sackville 13650, 15365, 17790, and audible in North America off the back. *BTW*, CRI has started a new language relay via Sackville, Arabic at 2000-2100 on 11865.

Alokesh Gupta found on their website that Radio Taiwan International was canceling all but two of its English relays via WYFR as of Nov 1. That leaves only the 0200 and 0300 hours on 5950.

Two new programs are offered via webcast only, says Rich Cuff, swprograms: *Chat Room*, a weekday informal magazine program, and *Soundwaves*, the latest in English and Chinese language popular music. See

http://english.rti.org.tw/default.aspx

RTI also canceled two hours of Spanish via WYFR due to poor reception, notifying Jean-Michel Aubier, in France; but surely those were much better in Latin America than from Taiwan direct!

Coincidentally(?), press reports via Alokesh Gupta, Dale Park and Dan Say spoke of a crisis at RTI, with several directors and board members resigning because the KMT Taiwan government tried to interfere and force RTI to treat mainland China nicely!

At least these three stations have not yet cut us off completely from shortwave in English, like Netherlands, BBC and Deutsche Welle.

ALBANIA R. Tirana B-08, English to Eu/NAm: Mon-Sat 1530-1600 13720; 1945-2000 11645, 7465; 2100-2130 9345, 7510; Tue-Sun 0130-0145 7485; 0245-0300 7390; 0330-0400 6110; 0430-0500 6100. Albanian to NAm, daily: 2130-2300 7510, 0000-0130 7485, 6110 (gh)

ARGENTINA RAE, which went off SW August 25 while waiting for replacement tubes, returned on Oct 8 (gh) 15345.17 at 2154 with IS and ID, fair (Ron Howard, CA, *DXLD*) Many more reports followed, frequency varying slightly above and below 15345 and hetting Morocco as before until 2200, so no improvement; same transmitter with Radio Nacional relay on weekends. RAE also 11711v in the evenings UT Tue-Sat including English 0200-0300. However, during DST in Buenos Aires (if it went into effect Oct 20 after a dispute) and lasting until March 15, all external programs one UT hour earlier including English at 0100 (gh)

AUSTRIA [and non] Surprised to hear some news in English on 6155 at 0610, giving temps in the Alps, 0611 into French, 0615 German. This has to be OE1, but these newscasts are not accounted for in *WRTH* nor in the page they refer us to: **http://oe1.orf.at/service/international_en**

English news M-F at 8:10 am CET [so now 0710 UT] is on the home service schedule at **http://oe1.orf.at/service/schema** (Dragan Lekic, Serbia, *DXLD*)

ORF sources confirm that the relay of the First Home Service program on SW via Moosbrunn might be discontinued soon, but no final decision will be taken before the future use of the site is established (gh)

On the *Postbox* segment of *Report from Austria*, Murray Hall announced that OE1 will continue on shortwave in 2009 after all, but all in English, no more Spanish (Will F., *DXLD*) Or German? (gh) Nobody is in charge at Vienna for the SW transmissions any longer (Gordon Brown, UK, NWDXC via *BC-DX*)

The relay via Canada is still scheduled for B-08 on 13675 at 1600-1700, presumably mixed English and German (gh)

BIAFRA [non] V. of Biafra International, Fridays only at 20-21 via WHRI, was on 15280 in July and August; in Sept back to 17650 as it was until July; On Oct 17 it was back on 15280, and in B-08 scheduled to move again to 15665. Abrupt frequency changes may be prompted by monitoring in Biafraland (gh)

BOLIVIA R. Panamericana, listed on 6105, heard instead on 5970 around 1000-1300 by Sergio, CW3CMZ, in la Boca de Rapel, Chile, confirmed by // to its webcast (Héctor Frías, Chile, *DXLD*) No other reports of this. After 1100 weekdays would be blocked by REE Costa Rica here. And what about another Bolivian, R. Nacional, Huanuni, 5968v, inactive? (gh)

R. Virgen de Remedios, Tupiza, which had been jumping between 4111 and 4555 kHz, was heard several dates in late September on 3985 between 0008 and 0204 (Rubens Ferraz Pedroso, *@tividade DX* and *DX Clube Paraná*) No one else reported this. Iran and Croatia also on 3985 (gh)

Radio Causachun Coca, Lauca Ñ, Chapare, is on 6075 with a 10 kW transmitter of the Continental Lensa brand. Pánfilo Condori Choque, general manager of the company that installed the transmitter, says the antenna system consists of two loop antennas with reflectors. Each antenna is supported by two 15-meter towers, and the reflector is six meters from the radiator. Location is at 16 59'48,00" S, 65 13'40,25" W, 265 meters above sea level (Henrik Klemetz, Sweden, *DXLD*)

BRAZIL 9819.96, Rádio 9 de Julho, São Paulo, with lively morning program from 0915 past 1030, another day from *1000, also at 0300 (Bryan Clark, New Zealand, RNZI and *DXLD*) But gone since early October (Jorge Freitas, Bahia, *dxclubepr* yahoogroup and Paul Miled, *radioescutas* yg) Sr. Marcos, the coordinator, says 9820 was turned off after some testing, for further adjustments, planned to resume in early November (Carlos André, São Paulo, *ibid.*)

Rádio Cultura AM, São Paulo, supposed to be on 9615 but heard on spurious 9285 at 2312 (Marcelo Xavier Vieira, *radioescutas* yg)

R. Cultura, Araraquara SP, inactive on 3365, came back Oct 11 at 0030 for a football game (Michel Viani, Brasil, *ibid.*)

Summer time in eastern/southern states started Oct 19, until Feb 15, UT -2 instead of -3 (Adalberto Marques de Azevedo, *ibid.*) But most northeastern and western states stay on UT -3 or UT -4 (timeanddate.com)

BULGARIA R. Bulgaria B-08 English: WEu 0730-0800 5900 7400; 1230-1300 11700 15700; 1830-1900 & 2200-2300 6200 7400. NAm 0000-0100 & 0300-0400 5900 7400. In Oct had to cut back to only one frequency at a time (*DX Mix News*)

CHINA Major domestic network relays on SW in Chinese include some English: CNR-1, 4460 at 1252 news conference about space mission, with English translations; CNR-2/China Business Radio, 6065, at 1323 with *English Evening,* special live weekend program (Ron Howard, CA, *DXLD*) ESL is very big in China; listen to Sept. 28 "Crazy English" documentary from

www.cbc.ca/thesundayedition/listen.html (gh)

Voice of Pujiang-Pujiang zhi Sheng changed to winter sked from Oct. 5: 1130v-1600 3280 4950, new 5075 ex 9705 (Hiroshi via S. Hasegawa, Japan, *NDXC*)

3303-USB, Zhoushan Maritime Meteorological Radio, *1401-1411*, Kenny G instrumental music (*Forever in Love*), woman in Chinese with assumed maritime weather, might be a new time. Dan Sheedy had been monitoring them in early Sept. around 1100-1112. Website: **http://220.189.205.5/default.asp** (Ron Howard, CA, *DXLD*)

CROATIA B-08 Croatian Radio HS-1 in Croatian via 100 kW Deanovec site, non-directional to WEu/NAf: 0558-0857 6165, 0858-1457 9830, 1458-2157 6165, 2158-0557 3985v (*DX Mix News*, Bulgaria) They may register 3985 as 100 kW, but I seriously doubt the power is anything close to it; signal strength indicates just a few kW. Could be a 10 kW transmitter, using an antenna

All times UTC; All frequencies kHz; * before hr = sign on, * after hr = sign off; // = parallel programming; + = continuing but not monitored; 2 x freq = 2nd harmonic; sesqui = one and a half; B-08=fall/winter season; [non] = Broadcast to or for the listed country, but not necessarily originating there; u.o.s. = unless otherwise stated

that can not handle higher powers (Kai Ludwig, Germany, *DXLD*) Or even 1 kW, with maximum 1 microvolt strength, weaker than 80m hams (Wolfgang Büschel, *ibid*.) If you register 100 kW instead of 1 kW, that helps keep other stations away from your very vulnerable frequency. Attention, CFRX! (gh)

[non] V. of Croatia via Germany B-08 finally gets out of the 40m hamband! To SAm and NAm on 7375 ex-7275, with usual overlap of antennas, and sites, Wertachtal except Nauen at 02-06; mostly in Croatian but some English and Spanish segments:

23-04 240 deg, 100 kW, Carib, CAm, all of SAm
00-04 300 deg, 100 kW, C&E USA, Maritimes, Labrador
02-06 325 deg, 125 kW, to above plus W USA, rest of Canada, except most of Ontario, Quebec and Baffin Island! Surely Toronto and Montreal are Croatian immigration hotbeds.

This allows HRT and DTK/M&B to cease pretending that the broadcasts to NAm are really for Iceland, and to SAm really for Au/NZ far beyond, which surely fooled only the most gullible. *But* – that leaves all the Croatians in Iceland out in the cold!

Also: 9470, 05-08 240 deg, 100 kW longpath to C&E Au, NZ; 11690, 06-10 270 deg, 125 kW, longpath to W&SE Australia, NZ (gh)

CUBA RHC added 13680 to 11760 for English at 2030-2130, but 13680 appeared only sporadically, and sometimes 11800 instead. 13680 also stayed on for Kriyol at 2230, but overridden by another Cuban transmitter from 2250 about to relay Venezuela at 2300, Cubans vs Cubans! English at 2300 was supposed to be on 9550, but heard instead of 9600 and 11800. Guaraní at 2230 on 17705 was very distorted and partly in Portuguese instead.

This is just a brief sampling of another month's worth of SNAFUs. And then there are all the jammers against nothing and spreading far beyond their intended frequencies (gh) Another one, 6000 in English beyond 0700 until 0733 on a Sunday (Noel Green, England, *DXLD*) When it is supposed to stay on another half hour, but in Esperanto (gh)

EGYPT R. Cairo tentative B-08 English: 1215-1330 17835; 1600-1800 12170; 1900-2030 9310; 2115-2245 Eu [& NAm] 6255; 2300-2430 NAm 6850; 0200-0330 NAm 7535. Arabic to Eu & NAm 1900-0700 6290; NAm 0030-0430 6850 (gh)

GERMANY [non] DW B08 English: **http://www.dw-world.de/popups/popup_pdf/0,,3311204,00.pdf** (via Joe Hanlon, *DXLD*)

Notably, 2100 via Rwanda is only on 11690, likely to confront continuous RTTY, instead of 15205 and 11865 which were excellent in CNAm all A-season. At 1900-1930 and 2000-2057, the only Kigali is 9735, but not for West Africa (and thence NAm) unlike 11690. To E & C Africa, 0400-0530 via Kigali 6180, with Greenville vacated (gh)

GREECE VOG QSL policy: We still send QSL cards. Send us a reception report by e-mail to apodimos_era5@ert.gr or by post (ERT - ERA5 Voice of Greece - Mesoghion 432 - 15342 Aghia, Paraskevi - Attiki - Greece) and we will send a QSL card to confirm. Don't forget to include your postal address. With our best greetings (Voice of Greece via John Babbis, *DXLD*)

GREENLAND 3815.0, at 2015 in late Sept, from Tasillaq, Ammasalik Radio with relay of KNR, Nuuk. Heard a few times lately, USB and weak. Still disturbed by Russian stations, Aurora (Stig Adolfsson, Sweden, *SW Bulletin*) Also tentatively at 2045, weak USB, best at 3814.96 (Mauno Ritola, Finland, *Cumbredx*) Seems reactivated, 200 watts, tentative two days in a row at 2045-2107* but sounds more like a Europirate, 2100 maybe news in Danish (Anker Petersen, Denmark, DSWCI *DX Window*) Winter sked should be one hour later, 2100-2215, also 1500-1615 (*WRTH* 2008) Still a very challenging catch in NAm (gh)

GUATEMALA R. Verdad, 4052.5, was knocked off the air Sept. 22 by a lightning bolt, which burned out some hard-to-find 600 volt power transistors and modules. This despite lightning arrestors and good grounding (Dr Edgar Amilcar Madrid, R. Verdad to gh) Replacements ordered from USA and hoped to be back by Oct 20 (Hans Johnson, *Cumbre DX*) Look for them at 0500-0600* mostly in English (gh)

HUNGARY B-08 Hungarian Radio in Hungarian from own site within Hungary, non-directional to WEu: 05-06 & 22-23 3975; 11-12 & 17-18 6025; also 306 degrees to NAm, 02-03 on 5995 (*DX Mix News*, Bulgaria) All IBB relays via Hungary ceased Sept 30. Mostly replaced by Biblis and Lampertheim, Germany (Wolfgang Büschel, *DXLD*)

However, Hungarian Radio registered new relays for B-08 via Wertachtal, Germany: to NAm 21-22 5970, 01-02 5980, 02-03 6145; to elsewhere: 05-08 Sun 6145, 11-12 3975, 12-13 17690, 15-18 & 19-20 3975; 19-20 9845 or 9895; 21-22 3975; 23-24 Sat/Sun 6025, daily 9665 (*DX Mix News*)

That's quite a surprise, since we thought SW broadcasts originating in Hungary were on their last legs (gh) I seriously doubt that these Wertachtal registrations are really for Magyar Rádió! (Kai Ludwig, Germany, *DXLD*)

INDONESIA After 2.5 months on 11785 or 11786, with interference from VOA, Firedrake, WHRI and Brazil, V. of Indonesia went back to 9526 in mid-October, for the English hour at 1300, greatly improving reception in NAm and escaping interference. There were other stations on 9525 before 1300 and after 1357 making a heterodyne. If they stay here in B-08, it should also work well. Each hour is made up of a string of talk features, such as *Indonesian Wonders, Let's Speak Bahasa Indonesia, Miscellany*; mostly music toward the end. Favorite slogan is "voice of dignity" (gh) VOI has three different transmitters which appear on three slightly different offsets from correct channels (Wolfgang Büschel, *DXLD*)

3987.05, RRI Manokwari at 1249-1400, back mid-Sept after a long absence, music and chat except Jakarta relay at 1301, VG signal.

3578.73, unknown Indonesian, 1238-1320+ scraps of audio (John Wilkins, CO, *Cumbre DX*) Well, *PWBR* 2007 showed 3579 as RSPD Maluku Tengah, Masahi, irregular with 400 watts at 0900-1410, and nothing else near that frequency. But *WRTH* 2008 showed 3579, RSPK, Ngada, at Bajawa, Flores, East Nusa Tenggara (gh)

N-1 Tuushinn second website by Atsunori Ishida is active again in Japanese (partly English). **http://n-1.at.webry.info/** (S. Hasegawa, *NDXC*) Lots of Indonesian logs and audio clips, SW and some MW (gh)

IRAN VIRI, 15150, wonderful muezzin reciting Qur'an, 1345-1412+ at least during Ramadan. Such a talent: would he also perform secular songs? Some of our greatest singers started out as cantors (gh)

IRELAND 6295, Reflections Europe, pirate, 2059-2210 Sundays only, gospel programs, not heard on // 12255 (Terry L Krueger, FL, *DXLD*)

ITALY Post-shortwave international broadcasting: you can still hear the news in English from Rai. Go to

www.rai.it then click on Radio, then click on Rai International Radio, then click on *Notturno Italiano*. This is an all-night Rai program heard in Europe on medium wave. It's available from 2320 to 0500 UT or, hour by hour, on demand. News in Italian is at the top of the hour, followed by English at about 5 minutes past, followed, sometimes, by news in French. The rest is in Italian, but most of it is an eclectic mix of music, nice to listen to while you're doing something around the house (Kim Andrew Elliott, *NASWA Journal*)

[non] B-08 NEXUS-IBA IRRS Shortwave from Milan via Slovakia 150 kW, with European Gospel Radio or Miraya FM Radio, Sudan:
0530-0630 5990 non-dir Eu/ME/NAf EGR English Mon-Thu
1030-1300 9510 non-dir Eu/ME/NAf EGR English Sun
1400-1430 15725 095 deg India/SAs EGR English Sun
1500-1800 15650 160 deg EAf/Sudan MIR English/Arabic Daily
1900-2100 7290 160 deg Eu/ME/NAf EGR English Fri-Sun
(*DX Mix News*, Bulgaria) Including *WORLD OF RADIO* Fri 2030 ex-1930

KOREA NORTH [non] Echo of Hope and Voice of the People broadcast by S. Korea both added new services at 2200-2400 at same times as their others:

Radio Echo of Hope/VOH, 0300-0500, 1100-1900 and 2200-2400 on 3985, 6003, 6348; Voice of the People, 1100-2100 and 2200-2400 on 3912, 6518, 6600 (Hiroshi via S. Hasegawa, Japan, *NDXC*)

KUWAIT R. Kuwait, English at 1800-2100 on 11990 not heard for a few days in late Sept. It was back a few days later, but not every day (Edwin Southwell, England, World DX Club *Contact*) And heard in mid-October (Rob Peebles, OH; Brian Alexander, PA; Wolfgang Büschel, Germany; Raúl Saavedra, CR, *DXLD*)

LAOS [non] WHRI added a third Hmong program in Oct, *Hmong North Radio*, UT Sat 0000-0030 and Sun 0100-0130 on 5875, excellent clear reception for recording of exotic rustic music; announcer sounds like the same one as on Hmong Lao Radio, under the auspices of one Liaj Sou Vang. Could be one UT hour later now (gh)

MÉXICO XEXQ, Radio UASLP, raised and improved its north-south inverted V SW antenna in mid-October for better reception on 6045. Schedule is 1300-0500 during standard time; still 250 watts awaiting authorization for 1000. Reports invited for QSL to Ing. Francisco Javier Moreno Cuéllar fjmcuellar@gmail.com with a copy to Ing. Ramón Ortíz Aguirre, raortiz@uaslp.mx (Julián Santiago Díez de Bonilla, DF, *DXLD*)

R. Educación, 6185, at 0000 gave contact addresses in Spanish and English, each twice: Apartado/P O Box 44277, 03101 México DF. This may be new; not as in *WRTH* 2008 which only gives a physical address (gh)

MYANMAR 5770, Myanmar Defense Forces via Taunggyi, indigenous marching music and pop songs, heard just about every day with poor to fair reception until 1529*, sometimes closing earlier.

9730.77, Myanma R., for an hour until 1539* with math and other lessons in English, vernacular (Ron Howard, Asilomar Beach, CA, *DXLD*)

[non] Tentative for B-08 is Democratic V. of Burma via VTC via "KHBN" Palau on 11880, at 1300-1400, 100 kW at 270 degrees (gh)

NETHERLANDS [non] After several years off, Arabic resumed from RNW Oct 27 (Andy Sennitt, *DXLD*) M-F 1859-1957 11830 via South Africa; 1959-2057 7385 via Vatican; 2159-2257 5970 via France, tentative sked (Wolfgang Büschel and Dragan Lekic, *ibid*.)

Also started English via DW Trincomalee, Sri Lanka, MW 1548 at 2300-2358. This indirectly replaces two hours via Bonaire (Kai Ludwig, Germany, *ibid*.) So RN would rather broadcast English at 4:30 am local time to India, than any SW in primetime to North America. I would dearly love to see the audience figures for that (gh)

NEW ZEALAND Since Sept 27, RNZI has been issuing a special 60th anniversary QSL card (Gautam Kumar Sharma, India, *DXLD*) Available until September 2009 or until stocks are exhausted; features several early designs from collection of the Radio Heritage Foundation. For info on how to get one, please visit **www.rnzi.com** Return postage [US$2] is required (David Ricquish, *WORLD OF RADIO*)

Ricquish also produced a 39-minute anniversary special; listen via **www.radionz.co.nz/specialfeatures/RNZI60th** (Chris Mackerell, NZ, *DXLD*)

PALAU T8WH/KHBN is really a one-of-a-kind hybrid, with two or three callsigns, under both FCC and Palauan administration, relay business both from IBB and VTC, and purchased (or part of it?) by World Harvest Radio. For B-08 no more transmissions are listed from KWHR Hawaii which it replaces (gh) See also MYANMAR [non]

PRIDNESTROVYE Radio PMR, Tiraspol, moved its European service at 1400-1700 from 12135 to 7370 on Sept 7 (*DX Mix News*, Bulgaria) Planned to stay on 7370 in B-08 but at 1500-1800; English, French and German quarter-hours alternate over and over. The NAm service at 2200-2400 on 6040 shifted to 2300-0100 on 6240, not 7 days a week, same three languages although German is not native to Moldova or North America (gh)

SRI LANKA [non] IBC Tamil Radio at 0000-0100 planned to replace 7205

Wertachtal with 5935 Nauen from Oct. 8 (Ivo Ivanov, Bulgaria, *DXLD*) But still heard on 7205 (Al Muick, Afghanistan; Jaisakthivel, India, *ibid.*) B-08 planned another shift, to 6045, really? (gh)

SUDAN [non] At the end of Sept, VOA started a new service for Darfur with little publicity, apparently in the local dialect of Arabic, at 0300-0330 on 4960, 5995, 11635; 1800-1830 on 4960, 9650, 11635; 1900-1930 on 5880, 9650, 11635. Sites included São Tomé, Germany, Sri Lanka, Thailand, Philippines (via *DX Mix News*, Bulgaria) But a few days later the 1800 broadcast on 4960 was monitored as Radio Free Iraq by mistake for at least two days. After that, the 0300 broadcast on all three frequencies carried the Radio Sawa service in Arabic instead. Later put on the correct Darfur service, but cannot understand the name (Tarek Zeidan, Egypt, *DXLD*)

I have learned from someone who works for the broadcast that its name is *Affia Darfur*. This is a colloquial greeting in Sudan, so it probably could be translated as "Hi, Darfur." More precisely, "Affia" means "good health" (Kim Andrew Elliott, *kimandrewelliott.com*)

These programs are produced in the Radio Sawa studios on the Boeing compound in Springfield, Virginia. Two VOA editors have been sent over to Radio Sawa to help with this special service, sponsored by the State Department, apparently an arrangement similar to the one for the BBC's Darfur Salaam transmissions which are or were (do they still exist?) separately financed by the BBC Trust and sponsored by the European Union and a foundation related to Ford (Kai Ludwig, *DXLD*)

Tentative frequencies changed for B-08: 0300 on 4960, 7340, 9440, 9845, 11855; 1800 on 5880, 9380, 12080, 15775; 1900 on 5880, 9390, 9815 (gh)

SYRIA Radio Damascus website

www.rtv.gov.sy started Oct 19 linking German programs for download. Please, write your letters and reception reports to Radio Damascus. They love to receive them: Radio Damascus, P. O. Box 4702, Damascus, Syrian Arab Republic (Kris Janssen, Belgium, *DXLD*) English page just said "Comming soon". We can hardly wait for English downloads too, since reception on SW is so poor, caused by poor transmission (gh)

English is only at 2100-2200 on 9330, but poorly received here too (Janssen) Registrations show azimuths as 340 and/or 98 degrees to Australia. Maybe it's only the latter, so no wonder we can't hear it, even when WBCQ is silent (gh, OK) 9330 at 2102-2125, "This is Damascus calling. Here now is the news." Fair to good signal but deep fades and the modulation wasn't the best (Rich D'Angelo, PA, NASWA *Flashsheet*)

UKRAINE RUI B-08 English: NAm 01-02 & 04-05 on 7440, 600 kW, 303 degrees via Lviv. All others are 100 kW from Kharkiv to WEu or Russia: 06-07 7440, 10-11 & 12-13 9950; 20-21 7510; 22-23 5830 (*DX Mix News*, Bulgaria)

The National Radio Company of Ukraine has designed and printed a series of the new QSL cards for RUI and home services of the Ukrainian Radio on all bands. Address: Radio Ukraine International, 26, Khreshchatyk str, 01001, Kyiv, Ukraine. E-mail reports welcome to vsru@nrcu.gov.ua

Reports on domestic service can go to National Radio Company of Ukraine, monitoring department, at same street address or by E-mail egorov@nrcu.gov.ua (Olex Yegorov, RUI *Whole World on the Radio Dial*)

UR-1 relay on 5970 scheduled at 0330-2300 for B-08. Should be clear until 0600, but later in the day several other European transmitters are on 5970, France, Germany, UK, Albania, Romania (gh)

U S A VOA Serbian, Bosnian, Macedonian, and Hindi services transmitted their last radio broadcasts on 30 September, but will continue via internet and/or television. Hindi has a weekly report on India's Aaj Tak TV. Serbian and Hindi were on shortwave until the end, while Bosnian and Macedonian were only via affiliates in their target countries, plus internet audio.

VOA Georgian was slated to close down completely, via all media, on 30 September, but the Georgian-Russian conflict has given that service an indefinite stay. The Broadcasting Board of Governors reversed its decisions to eliminate VOA radio in Turkish, Croatian, and Greek (*kimandrewelliott.com*)

The Greek service [not on SW] is supported by a strong Greek-American lobby and Congressional caucus, and will probably stay on the air forever. Radio Free Europe/Radio Liberty retains its radio broadcasts in Russian, Georgian, Ukrainian, Serbian, Bosnian, and Macedonian. VOA Ukrainian radio also has a stay until later in the year (Kim Andrew Elliott, *NASWA Journal*) Perhaps out of concern that Ukraine could be the next Georgia (gh)

Decision to keep VOA Ukrainian at least until yearend was made at very short notice. Editors even did their shows in the studio and were not sure if they were really still on air (Kai Ludwig, Germany, *DXLD*) A VOA press release called all this "restructuring" including cancellation of VOA Russian radio in late July (gh)

Not a single private US SW station broadcast the four vice/presidential debates as a public service – except for WBCQ which then put two of them on 5110. AFN, always plugged into all the networks, carried them on 7811.5-USB. VOA Greenville ran half an hour instead of Special English at 0130 on 6040, 9820, cutting in and out of the debates abruptly. Surprisingly, REE Spain broadcast all the debates live on 6055, 9535, with immediate translation into Spanish (gh)

In October, *Radio Newyork International* via WBCQ Sunday evenings changed from 7415 to 5110, at 0000-0300 UT Mondays, with Brother Stair engulfing more time on 7415. If still in effect, RNI would now be at 0100-0400 Mondays (gh)

QSO with Ted Randall tried different times and frequencies on WBCQ, WRMI. For latest schedule consult **www.tedrandall.com** (gh)

Rev. John H. Norris, 88, died Sept. 28 in York, PA. He was co-founder of Red Lion Broadcasting, WGCB and still owned WINB shortwave. He was at the center of a landmark "Fairness Doctrine" case involving a journalist being given equal time to rebut allegations from an evangelist carried by the station (via John Cereghin, DE, *DXLD*)

Obits: **http://ydr.inyork.com/ci_10604047** (via Kim Elliott, ibid.)

www.legacy.com/YORK/Obituaries.asp?Page=LifeStoryPrint&PersonID=118189240

And the Red Lion case: **http://www.oyez.org/cases/1960-1969/1968/1968_2_2/** (via Mike Terry, *DXLD*)

WINB's frequency change announcement to 9265 at 2058 on 13570 talks over *The Star Spangled Banner*, tantamount to flag desecration (gh)

KAIJ, Frisco TX dismantled: I drove by KAIJ in early August to find their wire log periodic had been removed, leaving the towers (and the old towers of their previous corner reflector system). Drove up to the building to find the door swinging open, so I took a peek inside. All equipment has been removed, and the building apparently raided for its copper. Left behind were leavings of the live-in technician (and his family?). Also large amounts of trash and several waist-high oil-filled capacitors inside an old storage container, very nasty (Pete, *DXLD*)

KTMI: construction permit for a new SW station in Oregon expired October 3. Will they get more time with a renewed or extended CP? (gh) Glenn, KTMI CP has been extended. My conversation with Mr. Robert Lund of KTMI indicated they may file a license application around mid-November to begin programming (Tom Polzin, FCC)

KTMI B-08 registrations per FCC, with 50 kW, azimuths:
0000-0145 11615 110 CAm/Caribbean
0200-0445 9445 130 Mexico
0500-0800 6025 70 Central Canada
1000-1400 9445 310 Kamchatka

I believe these target zones are what they have always planned, though on different frequencies. The last two are especially odd (gh)

XMAS IN MIAMI on WRMI – A series of short 7-minute *Viva Miami* segments with Christmas music from throughout the Caribbean and Latin America will air during the entire month of December, UT Tuesday-Saturday, in English at 0107 and Spanish at 0152.

Radio Prague relays will include many features about Christmas in the Czech Republic in the days around December 25, daily at 1000-1030, 1500, plus UT Tuesday-Saturday at 0300 and 0700.

Voice of the Center for Human Rights and Democracy Brigade 2506: Check Sundays December 21 and 28 for Christmas specials, at 1600-1615.

Trova Libre, mostly Cuban music, will have a special Christmas edition on UT Dec 22 and 29 at 0000-0030.

Maravillosas Palabras de Vida will have Christmas music from the Salvation Army brass band, UT Mondays at 0100-0115 during the season, all on 9955 and

www.wrmi.net (Jeff White, WRMI, *DXLD*)

VANUATU In late Sept, VTBC Port Vila began using a low power modified amateur radio transmitter to broadcast on 7260 kHz. The new 10 kW shortwave transmitters were still *en route*, delivery delayed (David Ricquish, Radio Heritage Foundation, *WORLD OF RADIO*)

VTBC blocked here by Mongolia on 7260 (S. Hasegawa, *NDXC*, Japan) At 0645 on 7259.98, blocked by Mongolia from 0655 (Mauno Ritola, Finland, *HCDX*) 7260 audible here at 0325-0400, blocked by Algeria via UK 0400-0600, and heard again after 0600; and past 0700 with news in Bislama (Bryan Clark, New Zealand, *DXLD*) Tentative at 1010 past 1030 (Dave Valko, PA, *Cumbre DX*) In B-08 7260 should be clear for this until FE Russia *1000 (gh)

VENEZUELA [non] Pres. Chávez suspended his *Aló, Presidente* show in Oct until after the late Nov elections; and in mid-October, the RHC relays were off the air. Check for him again now from 1400 Sundays on 17750, 13750, 13680, 11875, and listed 11690 instead of 11670, though there should be less QRM now on 11670 (gh)

YEMEN Yemen Radio, San'a on 6005 at 2153-2200* with rather hip R&B/funk vocal, possibly in Arabic, into short orchestral anthem at 2159, off 2200* two days in early October. BBCWS Seychelles weak underneath. No trace of nominal 9780 either day (Terry L Krueger, FL, *DXLD*) 6005 Yemen was supposedly scheduled at 12-15 only (gh)

ZAMBIA 1Africa, *a.k.a.* CVC, Lusaka, put surprisingly good signals into NAm on 13590, far beyond its Nigerian target, around 1900: because the 100 kW are aimed at 315 degrees, which goes on across the Atlantic to Cape Breton, Upper Michigan. A continuous musical bed is running, and heavily produced, *a cappella* talk being too dull to hold the attention of the younger African set this is aimed at; advertised an SMS number for a free friendship message, whoopee! Stealth evangelism in action, in stark contrast to neighbors on the dial, the plodding Harold Camping on WYFR 13615, and an equally soporific preacher on WINB 13570.

CVC 13590 was on the air long hours in A-08, 06-21, and earlier in the day collided with Portugal, Russia, China; and Germany with Bible Voice, Christians vs Christians! But for B-08 no more of that with 13590 tentatively reduced to 06-14, colliding only with Russia after 1200; then 13650 at 14-17, colliding with WHRA Sundays at 15-16; worst at 17-22 on 9420 colliding completely with Greece; but clear at 04-06 on 7160 (gh)

Until the Next, Best of DX and 73 de Glenn!

BROADCAST LOGS

NOTEWORTHY LOGS FROM OUR READERS

Gayle Van Horn, W4GVH
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http://mt-shortwave.blogspot.com

0000 UTC on 11790
ROMANIA: Radio Romania International. Station interval signal to website URL at sign-on. *Radio Newsweek* program with focus on Romanian economic growth. Station ID at 0110 to *Business Press* program. Signal good with occasional interferences. (Scott Barbour, Intervale, NH) 11904, 2039-2050. *Society Today* program. SINPO 44333 (Jim Evans, Germantown, TN).

0032 UTC on 4845
MAURITANIA: Radio Mauritanie. Occasional Arabic over traditional string music and vocals. Poor modulation, signal fair-good. Observed Koran recitations at 0637 recheck (Barbour).

0100 UTC on 11780
BRAZIL: Radio Nacional do Amazonia. Portuguese station ID to possible newscast and commercial jingles. Local music to station announcements. Signal fair-good (Brian Alexander, PA; Stewart MacKenzie, Huntington Beach, CA). Additional Brazilians in Portuguese: **Radio Bandeirantes** 6089.96, 0410-0510 // 9645.28 (Alexander) 6090, 0920-0932; **Radio Aparecida** 6135, 0917-0930 // 5035 (Barbour). **Radio Trans Mundial** 11734.9, 1737-1810+ (John Wilkins, Wheat Ridge, CO). **Radio Anhanguera** 4905, 0245-0256; **Radio Dif. De Macapa** 4915, 0257-0320; **Radio Globo Santos** 3385, 1125 (Joe Wood, Greenback, TN). **Radio Cultura Ondas Tropicas** 4845.2, 0202-0204* (Barbour). **Radio Trans Mundial** 11735, 1811-1832+; **Radio Brasil Central** (presumed) 11815, 2150-2203+ (Harold Frodge, Midland, MI/Cumbre DX). **Radio Record** (presumed) 6150, 0930; **Radio Tupi** 6060, 0939; **Radio Guaiba** (presumed) 6000, 0944; **Radio Clube Paranense** 6039.7, 0948 (Dave Valko, PA/HCDX).

0110 UTC on 3250.04
HONDURAS: Radio Luz y Vida. Spanish talk segment to local religious music. Signal poor-fair, **HRMI** 3339.98, 0115-0130. English to Spanish religious text translations; 0135-0200 including "Radio MI" identification and mentions of studio in California. Fair-good signal quality. (Alexander) HRMI 3340, 0908-0917 (English/Spanish) (Barbour).

0240 UTC on 5915
ZAMBIA: ZNBC. *Program 1*. Station sign-on with *Fish Eagle* interval signal. Choral national anthem at 0250, followed by vernacular talk to local choral music. Signal weak with adjacent channel splatter. *Program 2*, 6165, *0243-0250. Sign-on as Program 2. Programming barely audible under Radio Netherlands (Alexander). **CVC Int'l** via Lusaka, Zambia, 9430, 0535-0541, Religious programming amid poor signal with fades 13590, 1126-1140. (Barbour). CVC 13590, 1626-1633. ID/station promo to feature on history of Central African Republic. SIO 343 (Frodge).

0255 UTC on 7230
ETHIOPIA: Radio Fana. Interval signal to *Horn of Africa* style music. Signal weak and covered by BBC at 0300 sign-on // 6110 fair level but co-channel interference from WHRI at *0259 (Alexander).

0333 UTC on 6120
SOUTH AFRICA: Channel Africa. Swahili service including text to Afro pop music tunes. Station ID into newscast at 0335 (Wood). French service 7390, 0434 (MacKenzie). **Radio Okapi** via Meyerton, South Africa, 11690, 1636-1703.+ French speech coverage to ID pause. Drum signal at 1700 to bumper music and pop tunes at 1702. SIO 252 (Frodge).

0408 UTC on 17830
AUSTRALIA: Radio Australia (Shepparton). Soccer game coverage and discussion. SIO 433. 13630, 2215. Items on Western Australia, 9580 // 9710 feature on internet growth in Australia (MacKenzie). 6020, 1305 including news headlines and sport scores (J.L. Arcenaux, Lafayette, LA). **VL8T-Tennant Creek** 2325, 1230-1245.+ // 2325 and 2310 (fair signal quality) (Wilkins). **Radio Australia** (Brandon) 11660, 2102-2107.(Evans). CVC (Darwin) 17830, 0408. Religious music to Chinese text. SIO 333 (MacKenzie).

0422 UTC on 6010
MÉXICO: XEOI/Radio Mil. Program discussion to Mexican ballads and "buenas dias México" to listeners. SIO 343. Mexico's **XEPPM/Radio Educación** 6185, 0435-0441. Station ID to program *Musica Popular en México*. Repeat station ID to campesino music. SIO 433 with QRM from Vatican Radio (Frodge). 6184.95, 0510-0545 // 1060 weak under KYW Philadelphia (Alexander).

0937 UTC on 3279.82
ECUADOR: La Voz del Napo. Musical ballads to Spanish bits between tunes. Weak signal, but clear. (Barbour). Ecuador's **HCJB Global** 9745, 0412-0422 (Spanish) (MacKenzie).

1159 UTC on 6130
LAOS: Lao National Radio. String music interval signal to chimes at 1200. Brief announcement and anthem. Presumed Lao language at 1201. Lady announcer joined program at 1209 with chat to 1230 and vocal music. Signal pretty good (Wilkins).

1200 UTC on 4830
CHINA: Huai BC. Carrier on at 1200 to opening announcement at 1202. Chinese text from male/female announcers during fair conditions amid band noise. China's **Hulun Buir PBS** (presumed) 3900, 1244-1252. Music to lengthy Chinese text. Signal fading and almost gone by 1300 (Wilkins). **China Radio International** 15160, 0432 (Chinese), 15665, 0416 (Russian) // 15445 (MacKenzie). **CRI relay via Albania** 7285, 2140-2155 // 5960 (Alexander). CRI 11935, 1158-1215 (Russian) (Chuck Bolland, Clewiston, FL).

1227 UTC on 6003
CLANDESTINE: Echo of Hope. Announcer's Korean text to vocal music after 1230. Very good signal. **Shiokaze** 6020, *1400-1430.* Usual piano opening followed by Korean programming. Fair signal, should be excellent signal quality by DX season. Shiokaze via Yamata 6020, *1400-1408 (Wilkins).

1655 UTC on 6069.87
CANADA: CFRX. "News Talk 1010 CFRB" ID to local news at 1700. Traffic report to commercials and weather update. Good signal quality (Alexander). **Radio Canada Int'l** 13650, 1905 (Arabic); **Voice of Vietnam relay** (Sackville) 6175, 0307 (Spanish); **NHK/Radio Japan relay** (Sackville) 5960, 0325 (Japanese) (MacKenzie).

1751 UTC on 15190
EQUATORIAL GUINEA: Radio Africa (presumed). Station barely audible during religious sermons. No identification observed at 1800, though several addresses given. Signal improved by 1803 as religious format continues. SIO 242 (Frodge). Presumed **Radio Africa** 15190, 1115. (Barbour). **Radio Nacional-Bata** 5005, 2200. Interval signal to announcer's Spanish at tune-in. Last items at 2212. National anthem 2255-2258* (Valko). **Radio Nacional-Malabo** 6250, *0502-0530. National anthem at sign-on to Spanish opening announcements. Afro pop music amid poor-weak signal (Alexander).

1951 UTC on 9580
GABON: Afrique Numero Un. French conversation at tune-in, signal battling with co-channel Radio Australia's interval signal at 1958. Time signal pips at 2000 followed by extended interview. Signal fair at best. Monitored 9580, 2138-2151. *The Best of the Motown Sound* program interspersed with announcer's French bits. Signal quality fair (Barbour).

2235 UTC on 6070
LIBERIA: ELWA. Gospel music to closing announcements and Liberian national anthem at 2300. Poor signal quality with co-channel splatter. No sign of Canada's CFRX. Subsequent log 6070, 2250-2302* (Alexander).

2316 UTC on 5240
TIBET: Xizang PBS Lhasa. Service listed as Tibetan. Announcer duo at 2317, followed by extended talk to 2330. Poor signal but better than // 4920. Nothing heard on // 4905 (Barbour).

Additional loggings excluded for space constraints are posted as **Blog Logs** on the **Shortwave Central Blog** at the above web address.

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Thanks to our contributors – Have you sent in YOUR logs?
Send to Gayle Van Horn, c/o Monitoring Times
English broadcast unless otherwise noted.

PROGRAMMING SPOTLIGHT

WHAT'S ON WHEN AND WHERE?

Fred Waterer
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Sun, Fun and a Tropical Christmas

Here in the Northern Hemisphere, December means shorter days, colder weather, snow and Christmas. But for much of the world, it means, sun, summer holidays or a barbecue at the beach. Oh ... and Christmas.

It's certainly a different style of celebration in Asia, Australia, New Zealand and other warmer climes, with some familiar aspects. This month, we shine the *Programming Spotlight* on Christmas and Seasonal Programming in the sun.

In Australia and New Zealand, the arrival of the Christmas Season means the arrival of summer. For broadcasters like Radio New Zealand National and ABC Radio National, it means the advent of summer replacement programs, as many regular programs go on "summer hiatus."

In 2007 and early 2008, I stumbled onto perhaps one of the best programs I have heard in a long time. *Matinee Idle* is one of these summer programs. I had "tuned" in Radio New Zealand National via the internet, in order to hear a Louis Armstrong concert from the 1950s. Tuning in early, I started listening to this delightful program which preceded the concert. What a blast.

The Radio New Zealand website doesn't do the program justice: "Weekdays from 12:35 pm (2335 UTC) Phil O'Brien and Simon Morris present an afternoon of summer music and entertainment, including a selection of Classic Concerts each afternoon at 3.06 pm." Phil and Simon have a quirky sense of humor (seemingly common in New Zealand) and an extremely eclectic play list. I emailed Phil some questions, which he was kind enough to answer.

How long has (the show) been on the air?

The show started Boxing Day, 2004. It was offered to me simply because there wasn't anything else scheduled to cover the summer break. It was either "let O'Brien go in and play whatever he likes" or they were going to re-run old docos, interviews, etc. So they took a risk with me, and – thank God – it paid off.

Will it be back this year?

Yep – it's become a bit of a summer institution here now. It starts on Boxing Day and runs till late January. It's also on every public holiday on NZ – the next one is Labor Day, October 23rd.

I assume it is a summer show, replacing "normal" programming.

Yeah. (See above). It was a very radical step for this normally staid, "grown-up" radio network. Nothing like it had ever been done before. And the mere fact they let the presenter choose the music – that was a HUGE no-no till Mat Idle...

Christmas in Melbourne, Australia

How would you describe the show?

Chaotic. My girlfriend sums it up best of all: "Student Radio For The Elderly." Simon, however, calls it "Two old guys fighting for control of the CD player." I'm not sure how old Simon is – a couple of years older than me I think (I'm 55).

Have you and Simon always hosted the show? You guys sound like you are having a lot of fun...are you?

Originally (for the first two seasons) I had a producer named James Thomson. He's ex BBC who happened to be in the country and doing some part-time work for Radio NZ at the time. He was fantastic – a lovely guy who was so proud of the fact he knew absolutely nothing about music. But a very quick wit, and a terrific producer. He went back to the UK, and I requested Simon. He's someone I've known for years and is a bit of a legend in the movie / music industry in New Zealand.

I love "good radio." I really like that you make use of the internet, and the phones, and have that almost instant interactivity with the listeners. Is this unusual at RNZ or typical?

This is typical now, but (and I don't want to sound too immodest here) no one was doing it till *Matinee Idle*. I LOVE the technology and use the web / phones / texting etc., as much as possible. (Phil O'Brien)

As mentioned, RNZ and Radio National in Australia are in summer mode at this time of year. While plans for 2008-09 had not been announced as of this writing, check their websites just before Christmas. *Matinee Idle* and other programs *may* also be carried on shortwave. No doubt these or similar pages will be updated in time for the new season.

Radio NZ (2007): www.radionz.co.nz/media/whatrsquos_hot_radio_new_zealand_summer_season
ABC Radio National (2007): www.abc.net.au/rn/summer/

❖ Christmas in Asia

For information about Christmas in Asia, I turned to someone who would know far better than I. Victor Goonetillike is a well-known DXer and long-time *Media Network* correspondent in Asia.

"About Christmas, probably you are asking the correct person. As you know, other than for the Philippines, and in recent years S. Korea, there isn't significant numbers of Christian in Asia, but there are strong albeit small Christian communities in some parts of Asia, especially countries which were once under Portuguese colonial rule in South Asia. Also French Indo China.

"In India in Kerala and Goa and the North Eastern corner and in Sri Lanka there are strong Christian groups. In my own country Sri Lanka, out of a population of 20 million, close to 8% are Christians, out of which 7.2% are Roman Catholic.

"Christian music is a distinct part of the music culture of these areas, both in the vernacular and in English. Sri Lanka still has a few hours of English broadcasting to India on the All Asia Service, and the target these days is Goa, Bombay and the Southern coastal areas. The local service on the islands has many commercial broadcasters who along with the national broadcaster have an English service. On these services come December 1st, Christmas carols are played often, and also since Christmas and the January 1st New Year are also celebrated together. This is a time of holidays and festivity. Shop windows will carry Happy Christmas signs and interestingly enough with white cotton wool to catch a bit of snow culture at 25-35C temperatures year round.

"On the English programme you hear Bing Crosby, Marty Robins, Cliff Richard, Jim Reeves Nana Mouskouri, Daniel O Donald and Forster and Alan singing Christmas carols and songs very often. If you can pick up the SLBC All Asia Service 0100-0400 (Sun 0500) on 6005, 9770 and 15745 you will catch the Christmas feeling or listen to any domestic service in English from Sri Lanka on the Internet you will know what I mean. Christmas greeting cards and decorations and natural Christmas trees are on sale all over the parts of Asia I have mentioned. In Singapore,

Vietnam and Papua New Guinea it's the same. Yangon's English Service also carries some of it.

"By the way, I am a Roman Catholic, studied in one of the top public school on the Island, St. Joseph's College, and a faithful practicing Catholic along with that 7.2% of Sri Lankans. In my personal capacity, I've been a monitor for the Vatican Radio, Radio Veritas since 1969. And it's a coincidence that today I was trying to verify the rather strong signal around 15 past 1600 on 15855 is indeed meant for Asia. Christmas is one of the national festivals in India and Sri Lanka and indeed in Vietnam, Korea and in the urban areas of some other countries." (Victor Goonetillike)

❖ Christmas in the Caribbean –

WRMI Radio Miami International

"Here's what we've got planned so far. All programs, of course, on 9955 kHz. In giving you the UTC times, I have taken into account the local time change in November, so the UTC times are correct for December."

WRMI's Jeff White

Viva Miami – A series of short 7-minute *Viva Miami* segments with Christmas music from throughout the Caribbean and Latin America will air during the entire month of December, UTC Tuesday-Saturday, in English at 0107 and Spanish at 0152.

Radio Prague – Our relays of Radio Prague will include many features about Christmas in the Czech Republic in the days around December 25. The English relay is daily (7 days a week) at 1000-1030 and 1500-1530 UTC, plus UTC Tuesday-Saturday at 0300-0330 and 0700-0730.

Cuban Programs – WRMI airs many programs from Cuban exile organizations in Miami, which will include many special Christmas features around the holiday period. All of these are in Spanish, except for the Voice of the Center for Human Rights and Democracy Brigade 2506, which is in English, aired Sundays at 1600-1615 UTC. Check December 21 and 28 for Christmas specials.

Trova Libre – This is a musical program in Spanish (mostly Cuban music), which will have a special Christmas edition on UTC December 22 and 29 at 0000-0030.

Religious Programs – WRMI airs many religious programs in English and Spanish, which will air Christmas specials during the holiday period. Maravillosas Palabras de Vida, a Spanish program from the Salvation Army, will have Christmas music from the Salvation Army brass band, UTC Mondays at 0100-0115.

"Fred, I'm sure many of the other programs, which we air in both English and Spanish will have

Christmas specials, but there's nothing that I am specifically aware of right now. I hope this is of some help. Many thanks for asking! (Jeff White, WRMI)"

Of course there are many, traditional seasonal favorites from the Northern Hemisphere.

❖ BBC

Festival of Nine Lessons and Carols: (This schedule was accurate for 2007) This annual tradition continues on the BBC World Service as well as the domestic Radio 4 and Radio 3. Tune in on Christmas Eve, as follows:

1500 UT – Radio 4 / World Service live webcast / Europe SW / US public radio webcast including WGBH / KXPR / Vermont Public Radio / WKAR 90.5;
2130 UT – West Africa shortwave (15400, 6110 kHz);
0100 UT Christmas Day – Americas XM BBCWS;
1400 UT – BBC Radio 3; 2300 UT – Vermont Public Radio (Richard Cuff)

The Queen's Christmas Message will be heard at 1500 Christmas Day, via a number of BBC networks. And later on CBC Radio (and presumably on the CBC Northern Quebec Shortwave Service. Speaking of….

❖ Canada

As it Happens on Christmas Eve will broadcast its annual program of greetings for Canadian Forces Personnel around the world, followed by the traditional reading of "The Shepherd" by the late "Fireside Al" Maitland. 2330 UTC

CHML 900 (Hamilton, Ontario) carries a stunning program called A Paul Reid Christmas hosted by broadcasting legend, the late Paul Reid. Two hours of stories and music. It airs at 2300 UTC on Christmas Eve. Then throughout the evening, one can hear many hours of Christmas episodes of the old radio shows. Spend the evening with Jack Benny, Fibber Magee and others from yesteryear. Also tune in New Years Eve from 9pm-3am. Can't hear CHML? They stream at

www.900chml.com/

❖ Europe and the Americas

The Annual European Broadcasting Union marathon broadcast *Joy To The World* featuring Christmas concerts from 12 countries will be broadcast on BBC Radio 3 and CBC Radio 2, among others.

Vatican Radio will have details of the Pope's activities, as will WEWN in Alabama.

Some European stations really embrace the holiday season. Radio Prague in particular. Regular programs such as DW's *Hits in Germany* will have special Christmas editions. Voice of Russia will mark Christmas in the west, as well as Orthodox Christmas in January. Ukraine, Bulgaria and others in the region will feature stunningly beautiful choral music.

American based Christian radio stations will pretty much be business as usual.

❖ New Years Celebrations

Beginning at 1100 on Dec 31, in New Zealand, one can follow the New Year as it arrives around the world. This can be done via the internet and shortwave. 1300 at Radio Australia, 1500 in Japan, 1600 in Western Australia and Beijing, 2200 in much of Africa and Eastern Europe, 0000 UTC in the UK, 0200 in Brazil, 0500 in Eastern N America, 0800 in the Pacific Time Zone. It can be a fascinating experience to listen in on the celebrations around the world.

Finally, listen between Christmas and New Year's Day for end of the year surveys and other recorded programs marking the end of one year and the beginning of another. There's a lot out there to keep you informed, entertained and amused!

For up to the minute program listings, consult *World of Radio*, *DX Listening Digest*, and my own website **www.doghousecharlie.com/seasonal-programs-2008/**

Gayle Van Horn, W4GVH
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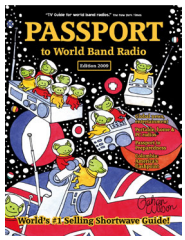
Holiday Listening Reference Books

Ready for the holidays? For this special edition, *QSL Report* focuses on radio reference books to aid radio monitoring and enhancing your hobby.

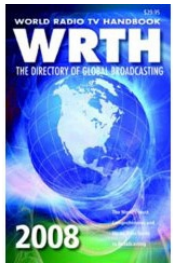
• The world's best-selling shortwave guide since 1984, *Passport to World Band Radio* has published an excellent aid for hobbyists. The new 2009, 25th edition includes program profiles, Addresses Plus, and the popular Blue Pages – listed in by-frequency order and also by broadcast time.



A feature on Colombia's radio history looks at narcoterrrorism. *Passport* review articles check out new receivers and antennas.

PTWBR is available from Grove Enterprises for $22.95. See Resources for contact info.

• DXers claim the *World Radio TV Handbook* is the bible of the radio hobby. Its 2009 edition is packed with reference guides for beginners, serious shortwave listeners or professional monitoring stations. The massive volume includes worldwide shortwave, TV and medium wave station contacts. You get multilingual frequency schedules, plus programming and more for $29.95 from Grove (see Resources).



• Imagine having your favorite *MT* feature or column for an entire year on one searchable CD-ROM. Frequency lists, shortwave program guides, equipment reviews, antenna projects, and much more will complement your listening or radio projects. The *MT Anthology 8 Year Set* is a complete set on eight CDs, covering 1999-2006 for $99.95. These complete issues are $79.95 to *MT* subscribers from Grove Enterprises. (Yearly anthologies are $19.95 per year, or $14.9 for subscribers.)

• The *Klingenfuss 2008 Super Frequency List* is the only CD that covers all broadcast stations worldwide plus all HF utility stations from 0 to 30 MHz. The broadcast database contains the latest schedules of clandestine, domestic and international broadcasting services on shortwave. The 2008 edition has been compiled by top experts in this field with the assistance of more than 100 experienced monitors worldwide. Grove's price is $28.95.

The 12th Edition of the *2008 Klingenfuss Shortwave Guide* has combined worldwide broadcast and utility stations in one edition, to comprise two reference aids in one book. The 474 page volume begins with "*Monitoring Utility Stations*," a how-to guide of features, and a by-frequency utility radio station list arranged with call signs, station name, mode and details.

The *"Frequency list of broadcast radio stations"* introduces the worldwide broadcast scene, including DRM (Digital Radio Mondiale) with a start/end DRM schedule. Broadcast stations are listed by frequency (2310-26045 kHz), station name, country, start/end times, language, target areas and remarks, and is also listed in alphabetical order.

For ordering information for the *2008 Klingenfuss Shortwave Frequency Guide* book, refer to: **www.klingenfuss.org** or Universal Radio **(see Resources below)** Book # 5055, $39.95 + S/H.

• The 10th edition of *Domestic Broadcast Survey* is published by the *Danish Shortwave Listener's Club International*, an active club of worldwide radio listeners from 33 countries

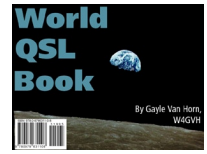
Divided into four parts, the *DBS* covers all active shortwave stations broadcasting on 2300-5700 kHz, domestic stations on international shortwave bands above 5700 kHz broadcasting to a domestic listening audience, active clandestine stations, and a list of all of the frequencies deleted between 2 and 30 MHz which have not been reported during the past five years, but which may possibly reappear

Information is based on sources that include DX bulletins, current schedules, and actual monitoring from radio hobbyists. Listings are in an easy to follow by-frequency format sorted by frequency, kW, country, station operating schedules, parallel frequencies and operating program format. Active stations are noted as A (Regular), B (Irregular), C (Sporadic) or D (Likely Inactive).

The 35 page edition is available by email as a PDF format (about 175 kB). A limited number are available in printed format. All buyers of the *DBS-10* will be given a username and password to the monthly updates on the tropical bands published as *Tropical Bands Monitor* on the club's website at **www.dswci.org.** Similar data from 2005-2007 is available from **www.dswci.org/tbm** to anyone.

Funds should be addressed to: Bent Nielsen-Treasurer, Egekrogen 14, DK 3500 Vaerloese, Denmark. Email edition: DKK 40.00 or USD 9.00; Euro 5.00 or GBP 4.00 or SEK 50.00 or 5 IRCs. Printed edition: DK 80.00 or USD 17.00 or EUR 11.00 or GBP 8.00 or SEK 105.00 or 9 IRCs. Additional information about payment by cash notes may be obtained at **www.dswci.org/**

• Looking to capture the extra edge for QSLing shortwave stations? *World QSL Book* has more than 500 pages covering every aspect of collecting QSL cards and other acknowledgments from stations heard in the HF spectrum. Chapters include a comprehensive tutorial on how to submit a reception report, do's and don'ts, and the pitfalls to avoid, plus new ideas. Successive chapters include amateur radio, utility, clandestine, shipping and cruising industries. The book includes specific station details and complete postal addresses and web URLs for querying any station. *World QSL Book* is available from Teak Publishing, or Grove Enterprises or Universal for $19.95 (see Resources for contact info).



• In October 2008, Teak Publishing released the much anticipated *International Callsign Handbook Vol. 2*. This new expanded edition of *1,414 pages* covers HF, VHF and UHF radio bands. The massive ebook on CD ROM uses the Adobe Acrobat platform, and all text is fully searchable and may be printed by the user.

International Callsign Handbook Vol. 2 is a concise world directory on CD-ROM of various types of radio station identifications, covering military, government, maritime, aeronautical, and fixed radio stations. Thousands of callsigns and other types of identifiers have been collected from the author's personal log book, official sources, and dedicated hobbyists who contributed their material. *ICH Vol. 2* is available for $19.95 from Teak Publishing, Grove Enterprises, or Universal Radio.

RESOURCES

Grove Enterprises
7540 Hwy. 64 W., Brasstown, NC 28902
800-438-8155; FAX 828-837-2216
order@grove-ent.com
www.grove-ent.com

Teak Publishing
P.O. Box 297, Brasstown, NC 28902

Universal Radio, Inc.
6830 Americana Parkway, Reynoldsburg, OH 43068-4113
800-431-3939; FAX 614 866-2339
www.universal-radio.com

How to Use the Shortwave Guide

0000-0100 twhfa USA, Voice of America 5995am 6130ca 7405am 9455af

① ② ⑤ ③ ④ ⑥ ⑦

Convert your time to UTC.

Broadcast time on ① and time off ② are expressed in Coordinated Universal Time (UTC) – the time at the 0 meridian near Greenwich, England. To translate your local time into UTC, first convert your local time to 24-hour format, then add (during Standard Time) 3, 4, 5 or 6 hours for Eastern, Central, Mountain or Pacific Times, respectively. Eastern, Central, and Pacific Times are already converted to UTC for you at the top of each hour.

Note that all *dates*, as well as times, are in UTC; for example, a show which might air at 0030 UTC *Sunday* will be heard on *Saturday* evening in America (in other words, 7:30 pm Eastern, 6:30 pm Central, etc.).

Find the station you want to hear.

Look at the page which corresponds to the time you will be listening. English broadcasts are listed by UTC time on ① , then alphabetically by country ③, followed by the station name ④. (If the station name is the same as the country, we don't repeat it, e.g., "Vanuatu, Radio" [Vanuatu].)

If a broadcast is not *daily*, the days of broadcast ⑤ will appear in the column following the time of broadcast, using the following codes:

Codes	
s/Sun	Sunday
m/Mon	Monday
t	Tuesday
w	Wednesday
h	Thursday
f	Friday
a/Sat	Saturday
occ:	occasional
DRM:	Digital Radio Mondiale
irreg	Irregular broadcasts
vl	Various languages
USB:	Upper Sideband

Choose the most promising frequencies for the time, location and conditions.

The frequencies ⑥ follow to the right of the station listing; all frequencies are listed in kilohertz (kHz). Not all listed stations will be heard from your location and virtually none of them will be heard all the time on all frequencies.

Shortwave broadcast stations change some of their frequencies at least twice a year, in April and October, to adapt to seasonal conditions. But they can also change in response to short-term conditions, interference, equipment problems, etc. Our frequency manager coordinates published station schedules with confirmations and reports from her monitoring team and *MT* readers to make the Shortwave Guide up-to-date as of one week before print deadline.

To help you find the most promising signal for your location, immediately following each frequency we've included information on the target area ⑦ of the broadcast. Signals beamed toward your area will generally be easier to hear than those beamed elsewhere, even though the latter will often still be audible.

Target Areas

af:	Africa
al:	alternate frequency (occasional use only)
am:	The Americas
as:	Asia
ca:	Central America
do:	domestic broadcast
eu:	Europe
me:	Middle East
na:	North America
pa:	Pacific
sa:	South America
va:	various

MT Monitoring Team

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Thank You …

Additional Contributors to This Month's Shortwave Guide:

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Shortwave Broadcast Bands

kHz	Meters
2300-2495	120 meters (Note 1)
3200-3400	90 meters (Note 1)
3900-3950	75 meters (Regional band, used for broadcasting in Asia only)
3950-4000	75 meters (Regional band, used for broadcasting in Asia and Europe)
4750-4995	60 meters (Note 1)
5005-5060	60 meters (Note 1)
5730-5900	49 meter NIB (Note 2)
5900-5950	49 meter WARC-92 band (Note 3)
5950-6200	49 meters
6200-6295	49 meter NIB (Note 2)
6890-6990	41 meter NIB (Note 2)
7100-7300	41 meters (Regional band, not allocated for broadcasting in the western hemisphere) (Note 4)
7300-7350	41 meter WARC-92 band (Note 3)
7350-7600	41 meter NIB (Note 2)
9250-9400	31 meter NIB (Note 2)
9400-9500	31 meter WARC-92 band (Note 3)
9500-9900	31 meters
11500-11600	25 meter NIB (Note 2)
11600-11650	25 meter WARC-92 band (Note 3)
11650-12050	25 meters
12050-12100	25 meter WARC-92 band (Note 3)
12100-12600	25 meter NIB (Note 2)
13570-13600	22 meter WARC-92 band (Note 3)
13600-13800	22 meters
13800-13870	22 meter WARC-92 band (Note 3)
15030-15100	19 meter NIB (Note 2)
15100-15600	19 meters
15600-15800	19 meter WARC-92 band (Note 3)
17480-17550	17 meter WARC-92 band (Note 3)
17550-17900	17 meters
18900-19020	15 meter WARC-92 band (Note 3)
21450-21850	13 meters
25670-26100	11 meters

Notes

Note 1 Tropical bands, 120/90/60 meters are for broadcast use only in designated tropical areas of the world.

Note 2 Broadcasters can use this frequency range on a (NIB) non-interference basis only.

Note 3 WARC-92 bands are allocated officially for use by HF broadcasting stations in 2007

Note 4 WRC-03 update. After March 29, 2009, the spectrum from 7100-7200 kHz will no longer be available for broadcast purposes and will be turned over to amateur radio operations worldwide

0000 UTC - 7PM EST / 6PM CST / 4PM PST

0000	0000		UK, BBC World Service	5970as	6195as		
			7105as	9410as	9740as	11955as	
			15335as	15360as	17615as		
0000	0004	vl	Croatia, Croatian Radio	7375va			
0000	0005		Canada, R Canada International			9755na	
0000	0015	mtwhf	Moldova, Radio PMR/Pridnestrovie			6040va	
0000	0020		Japan, NHK World Radio Japan			5920eu	
			6110na	6120na	6145na	11705na	
			13650as	17810as			
0000	0030		Australia, HCJB Global	15525as			
0000	0030	mtwhfa	Serbia, Voice of Serbia	6190va			
0000	0030		Thailand, Radio Thailand World Svc			9570af	
0000	0030		USA, Voice of America	7555as			
0000	0045		Egypt, Radio Cairo	9280eu			
0000	0045		India, All India Radio	9705as	9950as		
			11620as	11645as	13605as		
0000	0045		USA, WYFR/Family Radio Worldwide			17805sa	
0000	0057		Canada, R Canada International			9800as	
0000	0057		Germany, Deutsche Welle	7265as			
0000	0058		Germany, Deutsche Welle	9785as			
0000	0100		Anguilla, Worldwide Univ Network			6090am	
0000	0100		Australia, ABC NT Alice Springs			2310do	
			4835do				
0000	0100		Australia, ABC NT Katherine	5025do			
0000	0100		Australia, ABC NT Tennant Creek			4910do	
0000	0100		Australia, Radio Australia	9660as	12080as		
			13690as	15240pa	17715as	17750va	
			17775va	17795va			
0000	0100		Bulgaria, Radio Bulgaria	5900na	7400na		
0000	0100		Canada, CFVP Calgary AB	6030na			
0000	0100		Canada, CKZN St John's NF	6160na			
0000	0100		Canada, CKZU Vancouver BC	6160na			
0000	0100		China, China Radio International			6020na	
			6075as	6180as	7130eu	9570na	
			11885as	13750as	15125as		
0000	0100		Costa Rica, Worldwide Univ Network			5030va	
			6150va	7375va	9725va		
0000	0100		Germany, Deutsche Welle	15595as			
0000	0100		Guyana, Voice of Guyana	3291do			
0000	0100		Malaysia, RTM/Traxx FM	7295as			
0000	0100	DRM	New Zealand, Radio NZ International			17675pa	
0000	0100		New Zealand, Radio NZ International			15720pa	
0000	0100	vl	Papua New Guinea, Wantok R. Light			7325va	
0000	0100		Spain, Radio Exterior Espana	6055na			
0000	0100		USA, Armed Forces Radio Network			4319usb	
			5446usb	5765usb	6350usb	7811usb	
			10320usb	12132usb	13362usb		
0000	0100		USA, WBCQ Monticello ME	7415am	9330am		
0000	0100		USA, WBOH Newport NC	5920am			
0000	0100		USA, WEWN Vandiver AL	11520me			
0000	0100		USA, WHRA Greenbush ME	5850eu			
0000	0100		USA, WHRI Cypress Creek SC			5875na	
			7385na				
0000	0100		USA, WINB Red Lion PA	9265am			
0000	0100		USA, WRMI Miami FL	9955am			
0000	0100		USA, WTJC Newport NC	9370na			
0000	0100		USA, WWCR Nashville TN	5070na	5935na		
			7465na	9980na			
0000	0100		USA, WWRB Manchester TN	3185va	5050na		
			5745va	6180va			
0000	0100		USA, WYFR/Family Radio Worldwide			5950na	
			6985na	9505na	11835ca	15440na	
0000	0100		Zambia CVC/ The Voice - Africa			4965af	
0030	0045	Sun	Germany, Pan American BC	9640as			
0030	0100		Australia, Radio Australia	15415as			
0030	0100		China, China Radio International			11730as	
0030	0100		Lithuania, Radio Vilnius	11690na			
0030	0100		Thailand, Radio Thailand World Svc			12120na	
0030	0100	fas	UK, Bible Voice BC	6030as			
0030	0100		USA, Voice of America	9715va	9780va		
			11725va	15185va	15205va	15290va	
			15560va	17820va			

0100 UTC - 8PM EST/ 7PM CST / 5PM PST

0100	0104		Canada, R Canada International			9755na	
0100	0127		China, China Radio International			11730as	
0100	0127		Czech Rep, Radio Prague	6200na	7345na		
0100	0127		Slovakia, R Slovakia International			7230na	
			9440sa				
0100	0128		Vietnam, Voice of Vietnam	6175na			
0100	0130		Australia, Radio Australia	17775as			
0100	0130		Serbia, Voice of Serbia	6190va			
0100	0155		Turkey, Voice of Turkey	9620am			
0100	0156		Romania, R Romania International			6145na	
			9515na				
0100	0157		China, China Radio International			6020na	
			6175as	9470eu	9535as	9570na	
			9580na	9790na	11870as		
0100	0158	DRM	New Zealand, Radio NZ International			17675pa	
0100	0159		Canada, R Canada International			5840va	
			6165as	7255as			
0100	0200		Anguilla, Worldwide Univ Network			6090am	
0100	0200		Australia, ABC NT Katherine	5025do			
0100	0200		Australia, ABC NT Tennant Creek			4910do	
0100	0200		Australia, Radio Australia	9660as	12080as		
			13690as	15240pa	15415as	17715as	
			17795va				
0100	0200		Canada, CFVP Calgary AB	6030na			
0100	0200		Canada, CKZN St John's NF	6160na			
0100	0200		Canada, CKZU Vancouver BC	6160na			
0100	0200		Costa Rica, Worldwide Univ Network			5030va	
			6150va	7375va	9725va		
0100	0200		Cuba, Radio Havana Cuba	6000na	6140na		
0100	0200		Guyana, Voice of Guyana	3291do			
0100	0200		Malaysia, RTM/Traxx FM	7295as			
0100	0200		New Zealand, Radio NZ International			15720pa	
0100	0200		North Korea, Voice of Korea	4405as	7140as		
			9345as	9730as	11735am	12760am	
			15180am				
0100	0200	vl	Papua New Guinea, Wantok R. Light			7325va	
0100	0200		Russia, Voice of Russia	7250na	9665na		
			13755na	15425na			
0100	0200		Sri Lanka, SLBC	6005as	9770as	15745as	
0100	0200		Taiwan, R Taiwan International			11875as	
0100	0200		UK, BBC World Service	7320as	9410as		
			9740as	11750as	11955as	15310as	
			15335as	15360as	17615as		
0100	0200		Ukraine, R Ukraine International			7440na	
0100	0200		USA, Armed Forces Radio Network			4319usb	
			5446usb	5765usb	6350usb	7811usb	
			10320usb	12133usb	13362usb		
0100	0200		USA, KWHR Naalehu HI	17800as			
0100	0200		USA, Voice of America	7430va	9780va		
			11705as				
0100	0200		USA, WBCQ Monticello ME	5110am	7415am		
0100	0200		USA, WBOH Newport NC	5920am			
0100	0200		USA, WEWN Vandiver AL	11520me			
0100	0200		USA, WHRA Greenbush ME	5850eu			
0100	0200		USA, WHRI Cypress Creek SC			7385na	
0100	0200		USA, WINB Red Lion PA	9265am			
0100	0200		USA, WRMI Miami FL	9955am			
0100	0200		USA, WTJC Newport NC	9370na			
0100	0200		USA, WWCR Nashville TN	5070na	5935na		
			7465na	9980na			
0100	0200		USA, WWRB Manchester TN	3185va	5050na		
			5745va				
0100	0200		USA, WYFR/Family Radio Worldwide			5950na	
			6985na	9505na	15195as	15440na	
0100	0200		Uzbekistan, CVC International			11790as	
0100	0200		Zambia CVC/ The Voice - Africa			4965af	
0105	0200	twhfa	Canada, R Canada International			9755na	
0130	0145	twhfas	Albania, Radio Tirana	7485na			
0130	0200		Iran, IRIB	6120na	7160na		
0130	0200	twhfa	USA, Voice of America	6040va	9820va		
0140	0200		Vatican City, Vatican Radio	9650na			

0200 UTC - 9PM EST / 8PM CST / 6PM PST

0200	0204	twhfa	Canada, R Canada International			9755na	
0200	0227		Czech Rep, Radio Prague	6200na	7345na		
0200	0227		Iran, IRIB	6120na	7160na		
0200	0230		South Korea, KBS World Radio			9580sa	
0200	0230		Thailand, Radio Thailand World Svc			15275na	
0200	0245		USA, WYFR/Family Radio Worldwide			11835ca	
0200	0257		China, China Radio International			11770as	
			13640as				
0200	0259	Sun	Lithuania, Mighty KBC Radio	6055na			
0200	0300		Anguilla, Worldwide Univ Network			6090am	
0200	0300	mtwhf	Argentina, RAE	15345va			
0200	0300		Australia, ABC NT Alice Springs			2310do	
			4835do				
0200	0300		Australia, ABC NT Katherine	5025do			
0200	0300		Australia, ABC NT Tennant Creek			4910do	
0200	0300		Australia, Radio Australia	9660as	12080as		
			13690as	15240pa	15415as	15515as	
			17750va	21725va			
0200	0300		Canada, CFVP Calgary AB	6030na			
0200	0300		Canada, CKZN St John's NF	6160na			
0200	0300		Canada, CKZU Vancouver BC	6160na			
0200	0300		Costa Rica, Worldwide Univ Network			5030va	

			6150va	7375va	9725va	
0200	0300		Cuba, Radio Havana Cuba		6000na	6140na
0200	0300		Egypt, Radio Cairo		7270na	
0200	0300		Guyana, Voice of Guyana		3291do	
0200	0300		Indonesia, Voice of Indonesia		9526va	11784al
0200	0300		Malaysia, RTM/Traxx FM		7295as	
0200	0300	DRM	New Zealand, Radio NZ International			17675pa
0200	0300		New Zealand, Radio NZ International			15720pa
0200	0300		North Korea, Voice of Korea		3560as	13650as
			15100as			
0200	0300	vl	Papua New Guinea, Wantok R. Light			7325va
0200	0300		Philippines, Radio Pilipinas		11880va	15285va
			15510va			
0200	0300		Russia, Voice of Russia		9480na	9665na
			9860na	13635na	15425na	
0200	0300		Sri Lanka, SLBC	6005as	9770as	15745as
0200	0300		Taiwan, R Taiwan International			5950na
			9680na			
0200	0300		UK, BBC World Service		6035af	6195as
			9410va	11955as	15310as	
0200	0300		Ukraine, R Ukraine International			7440na
0200	0300		USA, Armed Forces Radio Network			4319usb
			5446usb	5765usb	6350usb	7811usb
			10320usb	12133usb	13362usb	
0200	0300		USA, KJES Vado NM		7555na	
0200	0300		USA, KJES Vado NM		7555na	
0200	0300		USA, KWHR Naalehu HI		17800as	
0200	0300		USA, WBCQ Monticello ME		5110am	7415am
0200	0300		USA, WBOH Newport NC		5920am	
0200	0300		USA, WEWN Vandiver AL		11520me	
0200	0300		USA, WHRA Greenbush ME		5850eu	
0200	0300		USA, WHRI Cypress Creek SC			5875na
			7385na			
0200	0300		USA, WINB Red Lion PA		9265am	
0200	0300		USA, WRMI Miami FL		9955am	
0200	0300		USA, WTJC Newport NC		9370na	
0200	0300		USA, WWCR Nashville TN		3215na	5070na
			5890na	5935na		
0200	0300		USA, WWRB Manchester TN		3185va	5050na
			5745va			
0200	0300		USA, WYFR/Family Radio Worldwide			5950na
			5985am	6985na	9505na	11855am
0200	0300		Uzbekistan, CVC International			11790as
0200	0300		Zambia CVC/ The Voice - Africa			4965af
0215	0230		Nepal, Radio Nepal		5005as	
0230	0257		China, China Radio International			15435me
0230	0258		Vietnam, Voice of Vietnam		6175ca	
0230	0300		Netherlands, R Netherlands Worldwide			11550as
0230	0300		South Korea, KBS World Radio			9560na
0230	0300		Sweden, Radio Sweden		6010na	11550va
0245	0300	twhfas	Albania, Radio Tirana		7390na	
0245	0300		Myanmar, Myanma Radio		9731do	
0250	0300		Vatican City, Vatican Radio		6040na	7305na
0255	0300	vl	Rwanda, Radio Rwanda		6055do	

0300 UTC - 10PM EST / 9PM CST / 7PM PST

0300	0319		Vatican City, Vatican Radio		6040na	7305na
0300	0327		Vatican City, Vatican Radio		7360af	9660af
0300	0330		Egypt, Radio Cairo		7270na	
0300	0330		Myanmar, Myanma Radio		9731do	
0300	0330		Philippines, Radio Pilipinas		11880va	15285va
			15510va			
0300	0330		Sri Lanka, SLBC	6005as	9770as	15745as
0300	0330	Sun	Swaziland, TWR	3200af		
0300	0330		USA, KJES Vado NM		7555na	
0300	0355		Turkey, Voice of Turkey		5975am	7265va
			7325na			
0300	0357		China, China Radio International			9690na
			9790na	15110as	11770as	13750as
			15120as	15785as		
0300	0358		Germany, Deutsche Welle		9800as	
0300	0359		Germany, Deutsche Welle		13810as	
0300	0400		Anguilla, Worldwide Univ Network			6090am
0300	0400		Australia, ABC NT Alice Springs			2310do
			4835do			
0300	0400		Australia, ABC NT Katherine		5025do	
0300	0400		Australia, ABC NT Tennant Creek			4910do
0300	0400		Australia, Radio Australia		9660as	12080as
			13690as	15240pa	15415as	15515as
			17750va	21725va		
0300	0400		Bulgaria, Radio Bulgaria		5900na	7400na
0300	0400	twhfas	Canada, CBC NQ SW Service		9625na	
0300	0400		Canada, CFVP Calgary AB		6030na	
0300	0400		Canada, CKZN St John's NF		6160na	
0300	0400		Canada, CKZU Vancouver BC		6160na	
0300	0400		Costa Rica, Worldwide Univ Network			5030va
			6150va	7375va	9725va	
0300	0400		Cuba, Radio Havana Cuba		6000na	6140na
0300	0400		Guyana, Voice of Guyana		3291do	
0300	0400		Malaysia, RTM/Traxx FM		7295as	
0300	0400		Malaysia, RTM/Voice of Malaysia			6175as
			9750as	15295as		
0300	0400		New Zealand, Radio NZ International			15720pa
0300	0400	DRM	New Zealand, Radio NZ International			17675pa
0300	0400		North Korea, Voice of Korea		4405as	7140as
			9345as	9730as		
0300	0400		Oman, Radio Oman		15355as	
0300	0400	vl	Papua New Guinea, Wantok R. Light			7325va
0300	0400		Russia, Voice of Russia		5900na	9800na
			9435na	9480na	9665na	9860na
			12065na	15735as		
0300	0400	vl	Rwanda, Radio Rwanda		6055do	
0300	0400		South Africa, Channel Africa		3345af	7390af
0300	0400		Taiwan, R Taiwan International			5950na
			15215sa	15320as		
0300	0400		UK, BBC World Service		3255af	6005af
			6145af	6190af	6195as	7160af
			9410va	9750af	12035af	15360as
			15310as	17790as		
0300	0400		USA, Armed Forces Radio Network			4319usb
			5446usb	5765usb	6350usb	7811usb
			10320usb	12133usb	13362usb	
0300	0400		USA, KWHR Naalehu HI		17800as	
0300	0400		USA, Voice of America		4930af	6080af
			9885af	12085af	15580af	
0300	0400		USA, WBCQ Monticello ME		5110am	7415am
0300	0400		USA, WBOH Newport NC		5920am	
0300	0400		USA, WEWN Vandiver AL		11520me	
0300	0400		USA, WHRA Greenbush ME		5850eu	
0300	0400	mtwhf	USA, WHRI Cypress Creek SC			6110na
0300	0400	Sat/Sun	USA, WHRI Cypress Creek SC			7385am
0300	0400		USA, WHRI Cypress Creek SC			5875na
0300	0400		USA, WRMI Miami FL		9955am	
0300	0400		USA, WTJC Newport NC		9370na	
0300	0400		USA, WWCR Nashville TN		3215na	5070na
			5890na	5935na		
0300	0400		USA, WWRB Manchester TN		3185va	5050na
			5745va			
0300	0400		USA, WYFR/Family Radio Worldwide			5950na
			6085na	9505na	11740sa	15255sa
0300	0400		Uzbekistan, CVC International			13680as
			15515as			
0300	0400		Zambia CVC/ The Voice - Africa			4965af
0330	0358		Vietnam, Voice of Vietnam		6175ca	
0330	0400	twhfas	Albania, Radio Tirana		6110na	
0330	0400		Sweden, Radio Sweden		6010na	
0330	0400		UK, BBC World Service		11945af	

0400 UTC - 11PM EST / 10PM CST / 8PM PST

0400	0427		Czech Rep, Radio Prague		6080na	6200na
			7345na			
0400	0430	mtwhf	France, Radio France International			9805af
			11995af			
0400	0430		Netherlands, R Netherlands Worldwide			9575af
0400	0430		USA, KWHR Naalehu HI		17800as	
0400	0430		USA, Voice of America		4930af	4960af
			6080af	9575af	11835af	12080af
			15580af			
0400	0430		USA, WWRB Manchester TN		3185va	
0400	0445		USA, WYFR/Family Radio Worldwide			6985na
			9505na			
0400	0456		Romania, R Romania International			6115na
			9515na	9690as	11895as	
0400	0457		China, China Radio International			6020na
			6080as	13750as	15120as	15785as
			17730as	17855as		
0400	0457		Germany, Deutsche Welle		5945af	
0400	0458		Germany, Deutsche Welle		15600af	
0400	0458		New Zealand, Radio NZ International			15720pa
0400	0458	DRM	New Zealand, Radio NZ International			17675pa
0400	0459		Germany, Deutsche Welle		5905af	
0400	0500		Anguilla, Worldwide Univ Network			6090am
0400	0500		Australia, ABC NT Alice Springs			2310do
			4835do			
0400	0500		Australia, ABC NT Katherine		5025do	
0400	0500		Australia, ABC NT Tennant Creek			4910do
0400	0500		Australia, Radio Australia		9660as	12080as
			13690as	15240pa	15415as	17750va
			21725va			
0400	0500	twhfas	Canada, CBC NQ SW Service		9625na	
0400	0500		Canada, CKZN St John's NF		6160na	
0400	0500		Canada, CKZU Vancouver BC		6160na	

0400	0500		Costa Rica, Worldwide Univ Network				5030va
			6150va	7375va	9725va		
0400	0500		Cuba, Radio Havana Cuba		6000na		6140na
0400	0500		Germany, Deutsche Welle		6180af		
0400	0500		Guyana, Voice of Guyana		3291do		
0400	0500		Malaysia, RTM/Traxx FM		7295as		
0400	0500		Malaysia, RTM/Voice of Malaysia				6175as
			9750as	15295as			
0400	0500		Netherlands, R Netherlands Worldwide				12080af
0400	0500	vl	Papua New Guinea, Wantok R. Light				7325va
0400	0500		Russia, Voice of Russia		5900na		9800na
			9665na	9860na	13635na		15735as
0400	0500	vl	Rwanda, Radio Rwanda		6055do		
0400	0500		South Africa, Channel Africa		7230af		
0400	0500	vl	Uganda, UBC Radio		4976do		5026do
0400	0500	DRM	UK, BBC World Service		5875eu		
0400	0500		UK, BBC World Service		3255af		6005af
			6190af	6195va	7120af		7160af
			11945af	12035va	12095as		15360as
			15565va	17790as			
0400	0500		Ukraine, R Ukraine International				7440eu
0400	0500		USA, Armed Forces Radio Network				4319usb
			5446usb	5765usb	6350usb		7811usb
			10320usb	12133usb	13362usb		
0400	0500		USA, WBCQ Monticello ME		5110am		
0400	0500		USA, WBOH Newport NC		5920am		
0400	0500		USA, WEWN Vandiver AL		11520me		
0400	0500		USA, WHRA Greenbush ME		5850eu		
0400	0500		USA, WHRI Cypress Creek SC				5875am
			7365am				
0400	0500		USA, WRMI Miami FL		9955am		
0400	0500		USA, WTJC Newport NC		9370na		
0400	0500		USA, WWCR Nashville TN		3215na		5070na
			5890na	5935na			
0400	0500		USA, WWRB Manchester TN		3185va		
0400	0500		USA, WYFR/Family Radio Worldwide				5950na
			6915na	7730va	9680na		9715ca
0400	0500		Uzbekistan, CVC International				13680as
			15515as				
0400	0500		Zambia CVC/ The Voice - Africa				4965af
0430	0457		Czech Rep, Radio Prague		9855af		
0430	0500	twhfas	Albania, Radio Tirana		6100na		
0430	0500		Australia, Radio Australia		15415as		
0430	0500		Nigeria, Radio Nigeria/Kaduna				6090do
0430	0500	mtwhf	Swaziland, TWR	3200af	4775af		
0459	0500		New Zealand, Radio NZ International				11725pa
0459	0500	DRM	New Zealand, Radio NZ International				15720pa

0500 UTC - 12AM EST / 11PM CST / 9PM PST

0500	0507	twhfas	Canada, CBC NQ SW Service		9625na		
0500	0527		Vatican City, Vatican Radio		9660af		11625af
			13765af				
0500	0529	`	Vatican City, Vatican Radio		5965eu		7250eu
0500	0530	mtwhf	France, Radio France International				13680af
			15160af				
0500	0530		Germany, Deutsche Welle		6180af		7285af
			9755af	12045af	15600af		
0500	0530		Japan, NHK World Radio Japan				5975eu
			6110na	9770af	9875as		15325as
0500	0557		China, China Radio International				6020na
			6190na	11880as	15350as		15465as
			17505me	17730as	17855as		
0500	0600		Anguilla, Worldwide Univ Network				6090am
0500	0600		Australia, ABC NT Alice Springs				2310do
			4835do				
0500	0600		Australia, ABC NT Katherine		5025do		
0500	0600		Australia, ABC NT Tennant Creek				4910do
0500	0600		Australia, Radio Australia		9660as		12080as
			13630as	13690pa	15160as		15240pa
			17750va				
0500	0600		Bhutan, Bhutan Broadcasting Svc				6035as
0500	0600		Canada, CKZN St John's NF		6160na		
0500	0600		Canada, CKZU Vancouver BC		6160na		
0500	0600		Costa Rica, Worldwide Univ Network				5030va
			6150va	7375va	9725va		
0500	0600		Cuba, Radio Havana Cuba		6000na		6060na
			6140na	9550na	11760am		
0500	0600		Guyana, Voice of Guyana		3291do		
0500	0600		Iran, IRIB		6120na		7160na
0500	0600		Kuwait, Radio Kuwait		15110me		
0500	0600		Malaysia, RTM/Traxx FM		7295as		
0500	0600		Malaysia, RTM/Voice of Malaysia				6175as
			9750as	15295as			
0500	0600		New Zealand, Radio NZ International				11725pa
0500	0600	DRM	New Zealand, Radio NZ International				15720pa
0500	0600		Nigeria, Radio Nigeria/Kaduna				4770do
0500	0600	vl	Papua New Guinea, Wantok R. Light				7325va
0500	0600		Russia, Voice of Russia		17635pa		21790pa
0500	0600		South Africa, Channel Africa		7230af		9745af
0500	0600		Swaziland, TWR	3200af			
0500	0600		Swaziland, TWR	4775af	6120af		9500af
0500	0600	vl	Uganda, UBC Radio		4976do		5026do
0500	0600		UK, BBC World Service		3255af		6005af
			6190af	6195va	7120af		7160af
			9410va	11945af	12095as		15310as
			15360as	15420af	15565va		17640af
			17790as				
0500	0600	DRM	UK, BBC World Service		6195af		
0500	0600		USA, Armed Forces Radio Network				4319usb
			5446usb	5765usb	6350usb		7811usb
			10320usb	12133usb	13362usb		
0500	0600		USA, KWHR Naalehu HI		9930as		13650as
0500	0600		USA, Voice of America		4930af		6080af
			6180af	12080af	15580af		
0500	0600		USA, WBCQ Monticello ME		5110am		
0500	0600		USA, WBOH Newport NC		5920am		
0500	0600		USA, WEWN Vandiver AL		11520me		
0500	0600	Sat/Sun	USA, WHRA Greenbush ME		7490va		
0500	0600		USA, WHRI Cypress Creek SC				5875am
			7365am				
0500	0600		USA, WRMI Miami FL		9955am		
0500	0600		USA, WTJC Newport NC		9370na		
0500	0600		USA, WWCR Nashville TN		3215na		5070na
			5890na	5935na			
0500	0600		USA, WWRB Manchester TN		3185va		
0500	0600		USA, WYFR/Family Radio Worldwide				5950na
			6915na	9355va	9680na		
0500	0600		Uzbekistan, CVC International				13680as
			15515as				
0500	0600		Zambia CVC/ The Voice - Africa				4965af
			9430af				
0515	0530	vl	Rwanda, Radio Rwanda		6055do		
0530	0600		Australia, Radio Australia		15415as		
0530	0600	mtwhf	Italy, NEXUS-IBA IRRS		5990va		
0530	0600	vl	Rwanda, Radio Rwanda		6055do		
0530	0600		Thailand, Radio Thailand World Svc				17655va

0600 UTC - 1AM EST / 12AM CST / 10PM PST

0600	0615	Sat/Sun	South Africa, Trans World Radio				11640af
0600	0629		Germany, Deutsche Welle		5945af		7240af
0600	0630	mtwhf	France, Radio France International				11725af
			15160af	17800af	17800af		
0600	0630		Germany, Deutsche Welle		12045af		
0600	0630	mtwhf	Italy, NEXUS-IBA IRRS		5990va		
0600	0630		Nigeria, Radio, National Svc/Abuja				7275do
0600	0645	mtwhf	South Africa, Trans World Radio				11640af
0600	0657		China, China Radio International				11710af
			11870me	11880as	13660as		15140me
			15350as	15465as	17505va		17540as
			17710as				
0600	0658		New Zealand, Radio NZ International				11725pa
0600	0658	DRM	New Zealand, Radio NZ International				15720pa
0600	0700		Anguilla, Worldwide Univ Network				6090am
0600	0700		Australia, ABC NT Alice Springs				2310do
			4835do				
0600	0700		Australia, ABC NT Katherine		5025do		
0600	0700		Australia, ABC NT Tennant Creek				4910do
0600	0700		Australia, CVC International		15335as		
0600	0700	Sat/Sun	Australia, Radio Australia		15415as		
0600	0700		Australia, Radio Australia		9660as		12080as
			13630as	13690as	15160as		15240pa
			15415as	15515pa	17750va		
0600	0700		Canada, CFVP Calgary AB		6030na		
0600	0700		Canada, CKZN St John's NF		6160na		
0600	0700		Canada, CKZU Vancouver BC		6160na		
0600	0700		Costa Rica, Worldwide Univ Network				5030va
			6150va	7375va	9725va		11870va
0600	0700		Cuba, Radio Havana Cuba		6000na		6060va
			6140na	9550na	11760na		
0600	0700		Guyana, Voice of Guyana		3291do		
0600	0700		Kuwait, Radio Kuwait		15110me		
0600	0700		Malaysia, RTM/Traxx FM		7295as		
0600	0700		Malaysia, RTM/Voice of Malaysia				6175as
			9750as	15295as			
0600	0700		Nigeria, Radio Nigeria/Kaduna				4770do
0600	0700	vl	Papua New Guinea, Wantok R. Light				7325va
0600	0700		Russia, Voice of Russia		17635pa		21790pa
0600	0700		South Africa, Channel Africa		7230af		15255af
0600	0700		Swaziland, TWR	4775af	6120af		9500af
0600	0700		UK, BBC World Service		6005af		6190af
			6195va	9860af	11765af		12095as
			13820af	15310as	15400af		17640af

			17790as			
0600	0700	Sat/Sun	UK, BBC World Service	15420af		
0600	0700	DRM	UK, BBC World Service	6195af		
0600	0700		Ukraine, R Ukraine International			7440eu
0600	0700		USA, Armed Forces Radio Network			4319usb
			5446usb	5765usb	6350usb	7811usb
			10320usb	12133usb	13362usb	
0600	0700		USA, KWHR Naalehu HI	9930as		13650as
0600	0700		USA, Voice of America	6080af		9885af
			12080af	15580af		
0600	0700		USA, WBCQ Monticello ME	5110am		
0600	0700		USA, WBOH Newport NC	5920am		
0600	0700		USA, WEWN Vandiver AL	7570eu		
0600	0700	Sat/Sun	USA, WHRA Greenbush ME	7490va		
0600	0700		USA, WHRI Cypress Creek SC			5875am
			7365am			
0600	0700		USA, WRMI Miami FL	9955am		
0600	0700		USA, WTJC Newport NC	9370na		
0600	0700		USA, WWCR Nashville TN	3215na		5070na
			5890na	5935na		
0600	0700		USA, WWRB Manchester TN	3185va		
0600	0700		USA, WYFR/Family Radio Worldwide			5850na
			7520va	9680na	11530af	11580va
0600	0700		Uzbekistan, CVC International			15515as
0600	0700	vl	Vanuatu, Radio Vanatu	3945al		7260do
0600	0700		Zambia CVC/ The Voice - Africa			6065af
			13590af			
0630	0644	mtwhfa	Vatican City, Vatican Radio	5965eu		7250eu
			9645eu	11740eu	15595eu	
0630	0656		Romania, R Romania International			7180eu
			9690eu	15135pa	17780pa	
0630	0700		Vatican City, Vatican Radio	11625af		13765af
			15570af			
0659	0700		New Zealand, Radio NZ International			9765pa
0659	0700	DRM	New Zealand, Radio NZ International			9870pa

0700 UTC - 2AM EST / 1AM CST / 11PM PST

0700	0706		UK, BBC World Service	6005af		
0700	0727		Slovakia, R Slovakia International			13715va
			15460va			
0700	0730		France, Radio France International			13675af
0700	0730	mtwhf	UK, BBC World Service	15575as		
0700	0745		USA, WYFR/Family Radio Worldwide			7520va
0700	0757		China, China Radio International			11880as
			13660as	13710eu	15350as	15465as
			17490eu	17540as	17710as	
0700	0800		Anguilla, Worldwide Univ Network			6090am
0700	0800		Australia, ABC NT Alice Springs			2310do
			4835do			
0700	0800		Australia, ABC NT Katherine	5025do		
0700	0800		Australia, ABC NT Tennant Creek			4910do
0700	0800		Australia, CVC International	15335as		
0700	0800		Australia, Radio Australia	9475as		9660as
			9710as	13630pa	15160as	15240pa
			15415as	17750va		
0700	0800		Bhutan, Bhutan Broadcasting Svc			6035as
0700	0800		Canada, CFVP Calgary AB	6030na		
0700	0800		Canada, CKZN St John's NF	6160na		
0700	0800		Canada, CKZU Vancouver BC	6160na		
0700	0800		Costa Rica, Worldwide Univ Network			5030va
			6150va	7375va	9725va	11870va
0700	0800	DRM	Germany, Deutsche Welle	7310eu		
0700	0800		Guyana, Voice of Guyana	3291do		
0700	0800		Kuwait, Radio Kuwait	15110me		
0700	0800	Sat	Latvia, Radio SWH	9290eu		
0700	0800		Liberia, Star Radio	9525af		
0700	0800		Malaysia, RTM/Traxx FM	7295as		
0700	0800		Malaysia, RTM/Voice of Malaysia			6175as
			9750as	15295as		
0700	0800		Myanmar, Myanma Radio	9731do		
0700	0800		New Zealand, Radio NZ International			9765pa
0700	0800	DRM	New Zealand, Radio NZ International			9870pa
0700	0800		Nigeria, Radio Nigeria/Kaduna			4770do
0700	0800	vl	Papua New Guinea, R East New Britain			3385do
0700	0800	vl	Papua New Guinea, Wantok R. Light			7325va
0700	0800		Russia, Voice of Russia	17495af		17635af
0700	0800	vl	Solomon Islands, SIBC	5020do		
0700	0800	vl	South Africa, Channel Africa	9625af		
0700	0800		Swaziland, TWR 4775af	6120af		9500af
0700	0800		Taiwan, R Taiwan International			5950na
0700	0800	Sat/Sun	UK, BBC World Service	15400af		15420af
			15575as			
0700	0800		UK, BBC World Service	6190af		9860af
			11760me	13820af	15310as	17790as
			17830af			
0700	0800	mtwhf	UK, BBC World Service	15400af		
0700	0800	Sat	UK, Bible Voice BC	5945eu		
0700	0800		USA, Armed Forces Radio Network			4319usb
			5446usb	5765usb	6350usb	7811usb
			10320usb	12133usb	13362usb	
0700	0800		USA, KWHR Naalehu HI	9930as		13650as
0700	0800		USA, WBCQ Monticello ME	5110am		
0700	0800		USA, WBOH Newport NC	5920am		
0700	0800		USA, WEWN Vandiver AL	7570eu		
0700	0800	mtwhf	USA, WHRI Cypress Creek SC			11565am
0700	0800		USA, WHRI Cypress Creek SC			7385na
0700	0800	Sat/Sun	USA, WHRI Cypress Creek SC			5875va
0700	0800		USA, WRMI Miami FL	9955am		
0700	0800		USA, WTJC Newport NC	9370na		
0700	0800		USA, WWCR Nashville TN	3215na		5070na
			5890na	5935na		
0700	0800		USA, WWRB Manchester TN	3185va		
0700	0800		USA, WYFR/Family Radio Worldwide			5985na
			6915na	9505na	9715na	9930af
0700	0800		Uzbekistan, CVC International			15515as
0700	0800	vl	Vanuatu, Radio Vanatu	3945al		7260do
0700	0800		Zambia CVC/ The Voice - Africa			6065af
			13590af			
0730	0800		Bulgaria, Radio Bulgaria	5900eu		7400eu
0745	0800	Sun	Germany, TWR-Europe	6105eu		
0745	0800	Sun	Monaco, TWR-Europe	9800eu		
0750	0800		Saudi Arabia, BSKSA	17785as		

0800 UTC - 3AM EST / 2AM CST / 12AM PST

0800	0815	Sat	Guam, KTWR/TWR	11840pa		
0800	0815	Sat	UK, Bible Voice BC	5945eu		
0800	0825		Malaysia, RTM/Voice of Malaysia			6175as
			9750as	15295as		
0800	0827		Czech Rep, Radio Prague	7345eu		9860eu
0800	0830		Australia, ABC NT Katherine	5025do		
0800	0830		Australia, ABC NT Tennant Creek			4910do
0800	0830		Myanmar, Myanma Radio	9731do		
0800	0835	mtwhf	Guam, KTWR/TWR	11840pa		
0800	0845		USA, WYFR/Family Radio Worldwide			5950ca
			9930af			
0800	0850	mtwhf	Germany, TWR-Europe	6105eu		
0800	0850	mtwhf	Monaco, TWR-Europe	9800eu		
0800	0857		China, China Radio International			11620as
			11880as	13710eu	15350as	15465as
			17490eu	17540as		
0800	0900		Anguilla, Worldwide Univ Network			6090am
0800	0900		Australia, ABC NT Alice Springs			2310do
			4835do			
0800	0900		Australia, CVC International	15335as		
0800	0900		Australia, Radio Australia	9475as		9580va
			9590va	9710as	12080pa	13630as
			15415as	17750va		
0800	0900		Bhutan, Bhutan Broadcasting Svc			6035as
0800	0900		Canada, CFVP Calgary AB	6030na		
0800	0900		Canada, CKZN St John's NF	6160na		
0800	0900		Canada, CKZU Vancouver BC	6160na		
0800	0900		Costa Rica, Worldwide Univ Network			5030va
			6150va	7375va	9725va	11870va
0800	0900	Sun	Germany, TWR-Europe	6105eu		
0800	0900		Guyana, Voice of Guyana	3291do		
0800	0900		Malaysia, RTM/Traxx FM	7295as		
0800	0900	Sun	Monaco, TWR-Europe	9800eu		
0800	0900		New Zealand, Radio NZ International			9765pa
0800	0900	DRM	New Zealand, Radio NZ International			9870pa
0800	0900		Nigeria, Radio Nigeria/Kaduna			4770do
0800	0900		Nigeria, Voice of Nigeria/Lagos			9690af
0800	0900	vl	Papua New Guinea, R East New Britain			3385do
0800	0900	vl	Papua New Guinea, Wantok R. Light			7325va
0800	0900		Russia, Voice of Russia	17495af		17635af
0800	0900	DRM	Russia, Voice of Russia	12060eu		15545eu
0800	0900	vl	Solomon Islands, SIBC	5020do		
0800	0900	vl	South Africa, Channel Africa	9625af		
0800	0900	Sun	South Africa, SA Radio League			7205af
			17860af			
0800	0900		South Korea, KBS World Radio			9570as
0800	0900		Swaziland, TWR 4775af	6120af		9500af
0800	0900		UK, BBC World Service	6190af		9860af
			11760me	15310as	15400af	17640as
			17790af	17830af	21470af	
0800	0900	Sat/Sun	UK, BBC World Service	15575as		
0800	0900	Sun	UK, Bible Voice BC	5945eu		
0800	0900		USA, Armed Forces Radio Network			4319usb
			5446usb	5765usb	6350usb	7811usb
			10320usb	12133usb	13362usb	
0800	0900		USA, KNLS Anchor Point AK	9615as		
0800	0900		USA, KWHR Naalehu HI	9930as		
0800	0900		USA, WBCQ Monticello ME	5110am		

0800	0900		USA, WBOH Newport NC	5920am	
0800	0900		USA, WEWN Vandiver AL	9355as	
0800	0900		USA, WHRI Cypress Creek SC		7385am
0800	0900	mtwhf	USA, WHRI Cypress Creek SC		11565va
0800	0900	Sat/Sun	USA, WHRI Cypress Creek SC		5875va
0800	0900		USA, WRMI Miami FL	9955am	
0800	0900		USA, WTJC Newport NC	9370na	
0800	0900		USA, WWCR Nashville TN	3215na	5070na
			5890na	5935na	
0800	0900		USA, WWRB Manchester TN	3185va	
0800	0900		USA, WYFR/Family Radio Worldwide		5985na
			6915na		
0800	0900		Uzbekistan, CVC International		15515as
0800	0900	vl	Vanuatu, Radio Vanatu	3945al	7260do
0800	0900		Zambia CVC/ The Voice - Africa		6065af
			13590af		
0805	0900	tf	Guam, KTWR/TWR	15170as	
0815	0850	Sat	Germany, TWR-Europe	6105eu	
0815	0850	Sat	Monaco, TWR-Europe	9800eu	
0815	0900	f	UK, Bible Voice BC	5945eu	
0820	0900	w	Guam, KTWR/TWR	15170as	
0830	0900		Australia, ABC NT Katherine	2485do	
0830	0900		Australia, ABC NT Tennant Creek		2325do
0830	0900	m	Guam, KTWR/TWR	15170as	
0830	0900		Lithuania, Radio Vilnius	9710na	

0900 UTC - 4AM EST / 3AM CST / 1AM PST

0900	0915	Sun	UK, Bible Voice BC	5945eu		
0900	0920	Sun	Germany, TWR-Europe	6105eu		
0900	0920	Sun	Monaco, TWR-Europe	9800eu		
0900	0930		Japan, NHK World Radio Japan			9625va
			9825pa	11815as	15590as	
0900	0957		China, China Radio International			11620as
			15210pa	15270eu	15350as	17490eu
			17570eu	17690pa	17750as	
0900	1000		Anguilla, Worldwide Univ Network			6090am
0900	1000		Australia, ABC NT Alice Springs			2310do
			4835do			
0900	1000		Australia, ABC NT Katherine	2485do		
0900	1000		Australia, ABC NT Tennant Creek			2325do
0900	1000		Australia, CVC International	15230as		
0900	1000		Australia, Radio Australia	9475va		9580va
			9590va	9710as	11880as	11945pa
			12080as	15415as		
0900	1000		Bhutan, Bhutan Broadcasting Svc			6035as
0900	1000		Canada, CFVP Calgary AB	6030na		
0900	1000		Canada, CKZN St John's NF	6160na		
0900	1000		Canada, CKZU Vancouver BC	6160na		
0900	1000		Costa Rica, Worldwide Univ Network			5030va
			6150va	7375va	9725va	11870va
			13750va			
0900	1000		Germany, Deutsche Welle	17710as		21840as
0900	1000		Guyana, Voice of Guyana	3291do		
0900	1000		Malaysia, RTM/Traxx FM	7295as		
0900	1000		Netherlands, R Netherlands Worldwide			9795as
0900	1000		New Zealand, Radio NZ International			9765pa
0900	1000	DRM	New Zealand, Radio NZ International			9870pa
0900	1000		Nigeria, Radio Nigeria/Kaduna			4770do
0900	1000		Nigeria, Voice of Nigeria/Lagos			9690af
0900	1000	vl	Papua New Guinea, R East New Britain			3385do
0900	1000	vl	Papua New Guinea, Wantok R. Light			7325va
0900	1000		Saudi Arabia, BSKSA	15250af		
0900	1000	vl	Solomon Islands, SIBC	5020do		
0900	1000	vl	South Africa, Channel Africa	9625af		
0900	1000		UK, BBC World Service	6190af		6195as
			9740as	9860af	11760me	15310as
			15400af	15575as	17640af	17760as
			17790as	17830af	21470af	21660as
0900	1000		USA, Armed Forces Radio Network			4319usb
			5446usb	5765usb	6350usb	7811usb
			10320usb	12133usb	13362usb	
0900	1000		USA, KWHR Naalehu HI	9930as		
0900	1000		USA, WBCQ Monticello ME	5110am		
0900	1000		USA, WBOH Newport NC	5920am		
0900	1000		USA, WEWN Vandiver AL	9355as		
0900	1000		USA, WHRI Cypress Creek SC			5875na
			7385am			
0900	1000		USA, WRMI Miami FL	9955am		
0900	1000		USA, WTJC Newport NC	9370na		
0900	1000		USA, WWCR Nashville TN	5070na		5890na
			5935na	9985na		
0900	1000		USA, WWRB Manchester TN	3185va		
0900	1000		USA, WYFR/Family Radio Worldwide			5985na
			6915na	9465as	9755ca	
0900	1000	vl	Vanuatu, Radio Vanatu	3945al		7260do
0900	1000		Zambia CVC/ The Voice - Africa			6065af
			13590af			
0905	1000	Sun	Greece, Voice of Greece	9420eu		15605eu

1000 UTC - 5AM EST / 4AM CST / 2AM PST

1000	1029		Czech Rep, Radio Prague	9955am		15710af
			11745af			
1000	1030		Vietnam, Voice of Vietnam	9840as		12020as
1000	1057		China, China Radio International			6040na
			11610as	11635as	13590as	13620as
			13720as	15190as	15210pa	15350as
			15390as	17490eu	17690pa	
1000	1058		New Zealand, Radio NZ International			9765pa
1000	1100		Anguilla, Worldwide Univ Network			11775am
1000	1100		Australia, ABC NT Alice Springs			2310do
			4835do			
1000	1100		Australia, ABC NT Katherine	2485do		
1000	1100		Australia, ABC NT Tennant Creek			2325do
1000	1100		Australia, CVC International	15230as		
1000	1100		Australia, Radio Australia	9580as		9590va
			9710as	11880as	11945pa	12080pa
			15415as			
1000	1100		Canada, CFVP Calgary AB	6030na		
1000	1100		Canada, CKZN St John's NF	6160na		
1000	1100		Canada, CKZU Vancouver BC	6160na		
1000	1100		Costa Rica, Worldwide Univ Network			5030va
			6150va	7375va	9725va	11870va
			13750va			
1000	1100		Guyana, Voice of Guyana	3291do		
1000	1100		India, All India Radio	7270as		13695pa
			15020as	15260as	15410as	17510pa
			17800as	17895pa		
1000	1100		Indonesia, Voice of Indonesia	9526va		11784al
1000	1100		Malaysia, RTM/Traxx FM	7295as		
1000	1100		Netherlands, R Netherlands Worldwide			6040as
			9720as	12065as		
1000	1100	DRM	New Zealand, Radio NZ International			9870pa
1000	1100		Nigeria, Radio Nigeria/Kaduna			4770do
1000	1100		Nigeria, Voice of Nigeria/Lagos			9690af
1000	1100		North Korea, Voice of Korea	11710am		11735as
			13650as	15180am		
1000	1100	vl	Papua New Guinea, R East New Britain			3385do
1000	1100	vl	Papua New Guinea, Wantok R. Light			7325va
1000	1100		Saudi Arabia, BSKSA	15250af		
1000	1100	vl	Solomon Islands, SIBC	5020do		
1000	1100	vl	South Africa, Channel Africa	9625af		
1000	1100		UK, BBC World Service	6195as		9740as
			11760me	15575as	17640af	17760as
			17790as	21470af	21660as	
1000	1100	Sat/Sun	UK, BBC World Service	15400af		17830af
1000	1100		Ukraine, R Ukraine International			9950eu
1000	1100		USA, Armed Forces Radio Network			4319usb
			5446usb	5765usb	6350usb	7811usb
			10320usb	12133usb	13362usb	
1000	1100		USA, KNLS Anchor Point AK	6150as		
1000	1100		USA, KWHR Naalehu HI	9930as		
1000	1100		USA, WBCQ Monticello ME	5110am		
1000	1100		USA, WBOH Newport NC	5920am		
1000	1100		USA, WEWN Vandiver AL	9355as		
1000	1100		USA, WHRI Cypress Creek SC			7385am
			9425am			
1000	1100		USA, WINB Red Lion PA	9265am		
1000	1100		USA, WRMI Miami FL	9955am		
1000	1100		USA, WTJC Newport NC	9370na		
1000	1100		USA, WWCR Nashville TN	5070na		5890na
			5935na	15825na		
1000	1100		USA, WWRB Manchester TN	3185va		
1000	1100		USA, WYFR/Family Radio Worldwide			5940na
			5985na	6915na	9465as	9755ca
1000	1100		Zambia CVC/ The Voice - Africa			6065af
			13590af			
1015	1045	Sun	UK, Bible Voice BC	5985as		
1030	1100		Guam, KSDA/ AWR	11780as		
1030	1100		Iran, IRIB	15460as	17660as	
1030	1100	Sun	Italy, NEXUS-IBA IRRS	9510va		
1030	1100		Mongolia, Voice of Mongolia	12085as		
1059	1100		New Zealand, Radio NZ International			13840pa

1100 UTC - 6AM EST / 5AM CST / 3AM PST

1100	1105		Pakistan, Radio Pakistan	15100as	17835as
1100	1127		Iran, IRIB	15460as	17660as
1100	1130		UK, BBC World Service	15400af	
1100	1130		Vietnam, Voice of Vietnam	7285as	
1100	1145		USA, WYFR/Family Radio Worldwide		9550sa
			9755ca		

1100	1157		China, China Radio International			5955as
			6040na	11650as	11660as	11750as
			11795as	13590as	13620eu	13720as
			13645as	17490eu		
1100	1158	DRM	New Zealand, Radio NZ International			9870pa
1100	1200		Anguilla, Worldwide Univ Network			11775am
1100	1200		Australia, ABC NT Alice Springs			2310do
			4835do			
1100	1200		Australia, ABC NT Katherine	2485do		
1100	1200		Australia, ABC NT Tennant Creek			2325do
1100	1200		Australia, CVC International	15635as		
1100	1200	DRM	Australia, Radio Australia	5995pa		
1100	1200		Australia, Radio Australia	5995va	6020va	
			9475as	9560as	9590va	11880as
			11945pa	12080as		
1100	1200	Sat/Sun	Canada, CBC NQ SW Service	9625na		
1100	1200		Canada, CFVP Calgary AB	6030na		
1100	1200		Canada, CKZN St John's NF	6160na		
1100	1200		Canada, CKZU Vancouver BC	6160na		
1100	1200		Costa Rica, Worldwide Univ Network			5030va
			6150va	7375va	9725va	11870va
			13750va			
1100	1200	Sun	Italy, NEXUS-IBA IRRS	9510va		
1100	1200		Malaysia, RTM/Traxx FM	7295as		
1100	1200		New Zealand, Radio NZ International			13840pa
1100	1200		Nigeria, Radio Nigeria/Kaduna			4770do
1100	1200		Nigeria, Voice of Nigeria/Lagos			9690af
1100	1200	vl	Papua New Guinea, R East New Britain			3385do
1100	1200	vl	Papua New Guinea, Wantok R. Light			7325va
1100	1200		Saudi Arabia, BSKSA	15250af		
1100	1200	vl	Solomon Islands, SIBC	5020do	9545al	
1100	1200	vl	South Africa, Channel Africa	9625af		
1100	1200		Taiwan, R Taiwan International			7445as
1100	1200		UK, BBC World Service	6190af	6195as	
			9740as	9860af	11760me	15310as
			15340as	15575as	17640af	17760as
			17790as	17830af	21470af	
1100	1200		USA, Armed Forces Radio Network			4319usb
			5446usb	5765usb	6350usb	7811usb
			10320usb	12133usb	13362usb	
1100	1200		USA, KWHR Naalehu HI	9930as		
1100	1200		USA, WBCQ Monticello ME	5110am		
1100	1200		USA, WBOH Newport NC	5920am		
1100	1200		USA, WEWN Vandiver AL	11560as		
1100	1200		USA, WHRI Cypress Creek SC			7385am
			9425am			
1100	1200		USA, WINB Red Lion PA	9265am		
1100	1200		USA, WRMI Miami FL	9955am		
1100	1200		USA, WTJC Newport NC	9370na		
1100	1200		USA, WWCR Nashville TN	5935na	7490na	
			9980na	15825na		
1100	1200		USA, WWRB Manchester TN	3185va		
1100	1200		USA, WYFR/Family Radio Worldwide			5950na
			5985na	7730sa	9625sa	
1100	1200		Zambia CVC/ The Voice - Africa			6065af
			13590af			
1115	1130	mwf	UK, Bible Voice BC	5950as		
1115	1145	st	UK, Bible Voice BC	5950as		
1115	1200	Sat	UK, Bible Voice BC	5950as		
1130	1157		Czech Rep, Radio Prague	11640eu	17545af	
1130	1200		Guam, KSDA/ AWR	15460as		
1130	1200		Vatican City, Vatican Radio	15595eu	17765eu	
1145	1200		UK, Bible Voice BC	5950as		

1200 UTC - 7AM EST / 6AM CST / 4AM PST

1200	1230		Australia, HCJB Global	15400as		
1200	1230		France, Radio France International			17800af
1200	1230		Japan, NHK World Radio Japan			6120na
			9625va	9695as	17585eu	
1200	1230		Saudi Arabia, BSKSA	15250af		
1200	1245		USA, WYFR/Family Radio Worldwide			5950na
			5985na			
1200	1257		China, China Radio International			5955as
			9460as	9600as	9645as	9730as
			9760pa	11650as	11660as	11760pa
			11980as	13645as	13650eu	13790eu
			17490eu			
1200	1258		New Zealand, Radio NZ International			13840pa
1200	1300		Anguilla, Worldwide Univ Network			11775am
1200	1300		Australia, ABC NT Alice Springs			2310do
			4835do			
1200	1300		Australia, ABC NT Katherine	2485do		
1200	1300		Australia, ABC NT Tennant Creek			2325do
1200	1300		Australia, CVC International	13635as		
1200	1300		Australia, Radio Australia	6020va	9475as	
			9560pa	9580va	9590va	11880as
			11945pa			
1200	1300	DRM	Australia, Radio Australia	5995va	12080pa	
1200	1300	Sat/Sun	Canada, CBC NQ SW Service	9625na		
1200	1300		Canada, CFVP Calgary AB	6030na		
1200	1300		Canada, CKZN St John's NF	6160na		
1200	1300		Canada, CKZU Vancouver BC	6160na		
1200	1300		Costa Rica, Worldwide Univ Network			9725va
			11870va	13750va		
1200	1300	Sun	Italy, NEXUS-IBA IRRS	9510va		
1200	1300	Sun	Latvia, Radio SWH	9290eu		
1200	1300		Malaysia, RTM/Traxx FM	7295as		
1200	1300		Nigeria, Radio Nigeria/Kaduna			4770do
1200	1300		Nigeria, Voice of Nigeria/Lagos			9690af
1200	1300	vl	Papua New Guinea, Wantok R. Light			7325va
1200	1300	vl	Solomon Islands, SIBC	5020do	9545al	
1200	1300		South Korea, KBS World Radio			9650na
1200	1300	f/ DRM	Taiwan, R Taiwan International			9850eu
1200	1300		UK, BBC World Service	6190af	6195as	
			9740as	9860af	11750as	11760me
			15310as	15575as	17640af	17790as
			17830af	21470af		
1200	1300		Ukraine, R Ukraine International			9950eu
1200	1300		USA, Armed Forces Radio Network			4319usb
			5446usb	5765usb	6350usb	7811usb
			10320usb	12133usb	13362usb	
1200	1300		USA, KNLS Anchor Point AK	6150as	6915as	
1200	1300		USA, KWHR Naalehu HI	12130as		
1200	1300		USA, Voice of America	6140va	9360va	
			9645va	9760va	12075va	
1200	1300		USA, WBCQ Monticello ME	9330am		
1200	1300		USA, WBOH Newport NC	5920am		
1200	1300		USA, WEWN Vandiver AL	11560as		
1200	1300	Sat/Sun	USA, WHRA Greenbush ME	15710va		
1200	1300	mtwhf	USA, WHRI Cypress Creek SC			9410na
1200	1300		USA, WHRI Cypress Creek SC			7385am
1200	1300		USA, WINB Red Lion PA	13570am		
1200	1300		USA, WRMI Miami FL	9955am		
1200	1300		USA, WTJC Newport NC	9370na		
1200	1300		USA, WWCR Nashville TN	7490na	9980na	
			13845na	15825na		
1200	1300		USA, WWRB Manchester TN	3185va		
1200	1300		USA, WYFR/Family Radio Worldwide			11520as
			11560as	17555sa	17795ca	
1200	1300		Zambia CVC/ The Voice - Africa			6065af
			13590af			
1215	1300		Egypt, Radio Cairo	17835as		
1228	1300	vl	Vatican City, Vatican Radio	11850as		
1230	1300	mtwhfa	Australia, HCJB Global	15540as		
1230	1300		Bangladesh, Bangla Betar	7250as		
1230	1300		Bulgaria, Radio Bulgaria	11700eu	15700eu	
1230	1300		Thailand, Radio Thailand World Svc			9835va
1230	1300		Turkey, Voice of Turkey	13685va	15450eu	
1230	1300		Vietnam, Voice of Vietnam	9840as	12020as	

1300 UTC - 8AM EST / 7AM CST / 5AM PST

1300	1325		Turkey, Voice of Turkey	13685pa	15450eu	
1300	1330	mtwhfa	Australia, HCJB Global	15540as		
1300	1330		Egypt, Radio Cairo	17835af		
1300	1330		Poland, Polish Radio	9450eu	7325eu	
1300	1356		Romania, R Romania International			15105eu
			17745eu			
1300	1357		China, China Radio International			5955as
			9570na	9650na	9730as	9760pa
			9765as	9870as	11660as	11760pa
			11980as	13610eu	13755as	13790eu
			15260na	15440as		
1300	1400		Anguilla, Worldwide Univ Network			11775am
1300	1400		Australia, CVC International	13635as		
1300	1400		Australia, Radio Australia	6020va	9560as	
			9580va	9590va		
1300	1400	DRM	Australia, Radio Australia	5995va	12080pa	
1300	1400	Sat/Sun	Canada, CBC NQ SW Service	9625na		
1300	1400		Canada, CFVP Calgary AB	6030na		
1300	1400		Canada, CKZN St John's NF	6160na		
1300	1400		Canada, CKZU Vancouver BC	6160na		
1300	1400		Costa Rica, Worldwide Univ Network			9725va
			11870va	13750va		
1300	1400		Indonesia, Voice of Indonesia	9526va	11784al	
1300	1400		Malaysia, RTM/Traxx FM	7295as		
1300	1400		New Zealand, Radio NZ International			6170pa
1300	1400		Nigeria, Radio Nigeria/Kaduna			4770do
1300	1400		Nigeria, Voice of Nigeria/Lagos			9690af
1300	1400		North Korea, Voice of Korea	3560eu	9335am	
			11710na	13760eu	15245eu	
1300	1400	vl	Papua New Guinea, Wantok R. Light			7325va
1300	1400	vl	Solomon Islands, SIBC	5020do	9545al	

SHORTWAVE GUIDE

1300	1400		South Korea, KBS World Radio			9570na
			9770as			
1300	1400		UK, BBC World Service		6190af	6195as
			9740as	9860af	11750as	11760me
			15310as	15420af	15575as	17640af
			17790as	21470af		
1300	1400		USA, Armed Forces Radio Network			4319usb
			5446usb	5765usb	6350usb	7811usb
			10320usb	12133usb	13362usb	
1300	1400	mtwhf	USA, KWHR Naalehu HI		9930as	
1300	1400	Sat/Sun	USA, KWHR Naalehu HI		12130as	
1300	1400		USA, Voice of America		9645va	9760va
1300	1400		USA, WBCQ Monticello ME		9330am	
1300	1400		USA, WBOH Newport NC		5920am	
1300	1400		USA, WEWN Vandiver AL		11560as	
1300	1400	Sat/Sun	USA, WHRA Greenbush ME		15710va	
1300	1400		USA, WHRI Cypress Creek SC			9840na
			11785am			
1300	1400		USA, WINB Red Lion PA		13570am	
1300	1400		USA, WRMI Miami FL		9955am	
1300	1400		USA, WTJC Newport NC		9370na	
1300	1400		USA, WWCR Nashville TN		7490na	9980na
			13845na	15825na		
1300	1400		USA, WWRB Manchester TN		9285va	
1300	1400		USA, WYFR/Family Radio Worldwide			11560as
			11820na	11865na	11910na	17630af
			17715af	17795ca		
1300	1400	vl	Vatican City, Vatican Radio		11850as	
1300	1400		Zambia CVC/ The Voice - Africa			6065af
			13590af			
1305	1320	m	Austria, Radio Austria International			13730eu
1305	1330	Sat/Sun	Austria, Radio Austria International			13730eu
1310	1340		Japan, NHK World Radio Japan			9875as
1330	1357	DRM	Czech Rep, Radio Prague		9850eu	
1330	1400	mthfa	Guam, KSDA/ AWR		15275as	
1330	1400		India, All India Radio		9690as	11620as
			13710as			
1330	1400		Laos, National Radio		7145as	
1330	1400		Sweden, Radio Sweden		7465va	
1330	1400		Vietnam, Voice of Vietnam		9840as	12020as
1335	1400	Sat/Sun	Austria, Radio Austria International			13730eu
1345	1400	hf	Austria, Radio Austria International			13730eu
1355	1400		Guam, KTWR/TWR		9975as	

1400 UTC - 9AM EST / 8AM CST / 6AM PST

1400	1415	mtwhf	Moldova, Radio PMR/Pridnestrovie			7370eu
1400	1429		Czech Rep, Radio Prague		11600as	13580na
1400	1430	Sun	Australia, HCJB Global		15425as	
1400	1430	mtwhfa	Australia, HCJB Global		15400as	
1400	1430	sw	Germany, Pan American BC		15205as	
1400	1430	mhf	Guam, KTWR/TWR		9975as	
1400	1430	Sun	Italy, NEXUS-IBA IRRS		15725va	
1400	1430	`	Japan, NHK World Radio Japan			9875as
			11705va	11780eu	21560eu	
1400	1430		Thailand, Radio Thailand World Svc			9805va
1400	1430	Sun	United Arab Emirates, FEBA		12045as	
1400	1457		China, China Radio International			5995as
			9765as	9870as	11675as	11765as
			13685af	13710eu	13740na	13790eu
			17630af			
1400	1500		Anguilla, Worldwide Univ Network			11775am
1400	1500		Australia, CVC International		13635as	
1400	1500		Australia, Radio Australia		5995va	6080va
			7240va	9590va		
1400	1500		Bhutan, Bhutan Broadcasting Svc			6035as
1400	1500	Sat/Sun	Canada, CBC NQ SW Service		9625na	
1400	1500		Canada, CFVP Calgary AB		6030na	
1400	1500		Canada, CKZN St John's NF		6160na	
1400	1500		Canada, CKZU Vancouver BC		6160na	
1400	1500		Costa Rica, Worldwide Univ Network			9725va
			11870va	13750va		
1400	1500	DRM	Germany, CVC Intl/Voice Africa			7270eu
1400	1500		Germany, Overcomer Ministries			6110eu
			13810va			
1400	1500	tw	Guam, KTWR/TWR		9975as	
1400	1500		India, All India Radio		9690as	11620as
			13710as			
1400	1500		Iran, IRIB	15460as	17660as	
1400	1500		Jordan, Radio Jordan		11690na	
1400	1500		Libya, Voice of Africa		17725af	21695af
1400	1500		Malaysia, RTM/Traxx FM		7295as	
1400	1500		Netherlands, R Netherlands Worldwide			5825as
			9345as	11520as	12080as	15595as
1400	1500		New Zealand, Radio NZ International			6170pa
1400	1500		Nigeria, Radio Nigeria/Kaduna			4770do
1400	1500		Nigeria, Voice of Nigeria/Lagos			9690af
1400	1500		Oman, Radio Oman		15140as	
1400	1500	vl	Papua New Guinea, Wantok R. Light			7325va
1400	1500	DRM	Russia, Voice of Russia		9750eu	
1400	1500		Russia, Voice of Russia		7165as	7255as
			9625as	9660as	9745as	11755as
			15605as	15660as		
1400	1500	vl	Solomon Islands, SIBC		5020do	9545al
1400	1500		UK, BBC World Service		5980as	6190af
			6195as	9740as	11920as	12095as
			15310as	17640af	17830af	21470af
1400	1500	Sat/Sun	UK, Bible Voice BC		11695as	
1400	1500		USA, Armed Forces Radio Network			4319usb
			5446usb	5765usb	6350usb	7811usb
			10320usb	12133usb	13362usb	
1400	1500		USA, KJES Vado NM		11715na	
1400	1500		USA, KNLS Anchor Point AK		6150as	
1400	1500		USA, KWHR Naalehu HI		9930as	
1400	1500		USA, Voice of America		4930af	6080af
			7430va	9345as	9760va	13750af
			15530va	15580af	17530af	17750af
1400	1500		USA, WBCQ Monticello ME		9930am	
1400	1500		USA, WBOH Newport NC		5920am	
1400	1500		USA, WEWN Vandiver AL		15855as	
1400	1500	Sat/Sun	USA, WHRA Greenbush ME		15195va	
1400	1500		USA, WHRI Cypress Creek SC			9495na
			9840na	11785am		
1400	1500		USA, WINB Red Lion PA		13570am	
1400	1500		USA, WRMI Miami FL		9955na	
1400	1500		USA, WTJC Newport NC		9370na	
1400	1500		USA, WWCR Nashville TN		7490na	9980na
			13845na	15825na		
1400	1500		USA, WWRB Manchester TN		9385va	
1400	1500		USA, WYFR/Family Radio Worldwide			11560na
			11830na	11860as	11910na	13695af
			17630af	17715ca	17795ca	
1400	1500	vl	Vatican City, Vatican Radio		11850as	
1400	1500		Zambia CVC/ The Voice - Africa			6065af
			13590af			
1415	1430	mtwhfa	Germany, Pan American BC		15205as	
1415	1430		Nepal, Radio Nepal		5005as	
1430	1445	Sun	Germany, Pan American BC		15205as	
1430	1459		Vatican City, Vatican Radio		4885eu	7250eu
			9645eu			
1430	1500		Australia, Radio Australia		9475va	11660pa
1430	1500		Ethiopia, Radio Ethiopia		5990af	7110af
			9704af			
1430	1500	f/ DRM	South Korea, KBS World Radio			9460eu
1430	1500		Sweden, Radio Sweden		9400va	
1445	1500	mtwhf	Moldova, Radio PMR/Pridnestrovie			7370eu

1500 UTC - 10AM EST / 9AM CST / 7AM PST

1500	1510	mtwhfa	Turkmenistan, Turkmen Radio		5015eu	
1500	1527		Czech Rep, Radio Prague		9955na	
1500	1528		Vietnam, Voice of Vietnam		7285va	9840va
			12020va			
1500	1530		Guam, KSDA/ AWR		11985as	
1500	1530		Nigeria, Radio, National Svc/Abuja			7275do
1500	1530		UK, BBC World Service		7380af	11860af
			15420af			
1500	1530	Sat	UK, Bible Voice BC		11895as	
1500	1530	vl	Venezuela, R Nacional de Venezuela			11680sa
1500	1545		USA, WYFR/Family Radio Worldwide			15770sa
1500	1550		New Zealand, Radio NZ International			6170pa
1500	1550	vl	Vatican City, Vatican Radio		11850as	
1500	1557		Canada, R Canada International			9635as
			11975as			
1500	1557		China, China Radio International			5955as
			6100af	7160as	7325as	9800as
			9870as	11965eu	13640eu	13685af
			13740na	17630af		
1500	1600		Anguilla, Worldwide Univ Network			11775am
1500	1600		Australia, CVC International		13635as	
1500	1600		Australia, Radio Australia		5995va	6080va
			7240as	9475va	9590as	11660pa
1500	1600	Sat/Sun	Canada, CBC NQ SW Service		9625na	
1500	1600		Canada, CFVP Calgary AB		6030na	
1500	1600		Canada, CKZN St John's NF		6160na	
1500	1600		Canada, CKZU Vancouver BC		6160na	
1500	1600		Costa Rica, Worldwide Univ Network			9725va
			11870va	13750va		
1500	1600	DRM	Germany, CVC Intl/Voice Africa			7270eu
1500	1600	vl	Germany, Germany, AWR-Europe			15225as
1500	1600		Germany, Overcomer Ministries			6110eu
			17485af			
1500	1600	vl	Italy, NEXUS-IBA IRRS		15650af	
1500	1600		Jordan, Radio Jordan		11690na	

1500	1600		Libya, Voice of Africa	17725af	21695af	
1500	1600		Malaysia, RTM/Traxx FM	7295as		
1500	1600		Myanmar, Myanma Radio	5985as		
1500	1600		Netherlands, R Netherlands Worldwide	5825as		
			9345as	11520as	12080as	15595as
1500	1600		Nigeria, Radio Nigeria/Kaduna	4770do		
1500	1600		Nigeria, Voice of Nigeria/Lagos	9690af		
1500	1600		North Korea, Voice of Korea	3560eu	9335na	
			11710eu	13760eu	15245eu	
1500	1600	vl	Papua New Guinea, Wantok R. Light	7325va		
1500	1600		Russia, Voice of Russia	4965va	9810eu	
1500	1600	vl	Slovakia, Miraya FM Radio	15650af		
1500	1600	vl	Solomon Islands, SIBC	5020do	9545al	
1500	1600	vl	South Africa, Channel Africa	9625af		
1500	1600		Uganda, Dunamis Shortwave	4750af		
1500	1600		UK, BBC World Service	5975as	5980as	
			6190af	6195as	9740as	9860af
			11920as	12095va	15310as	15400af
			17640af	17830af	21470af	
1500	1600	Sat/Sun	UK, BBC World Service	7380af	15420af	
1500	1600		USA, Armed Forces Radio Network	4319usb		
			5446usb	5765usb	6350usb	7811usb
			10320usb	12133usb	13362usb	
1500	1600		USA, KJES Vado NM	11715na		
1500	1600		USA, KWHR Naalehu HI	9930as		
1500	1600		USA, Voice of America	6160va	7125va	
			7430va	9345as	9695va	9760va
			12150va	13570af	15310va	15530va
			15550va	15580va	17895af	
1500	1600		USA, WBCQ Monticello ME	9930am		
1500	1600		USA, WBOH Newport NC	5920am		
1500	1600		USA, WEWN Vandiver AL	15855as		
1500	1600	Sat/Sun	USA, WHRA Greenbush ME	15195va		
1500	1600		USA, WHRI Cypress Creek SC	9495na		
			9840na	11785am		
1500	1600		USA, WINB Red Lion PA	13570am		
1500	1600		USA, WRMI Miami FL	9955na		
1500	1600		USA, WTJC Newport NC	9370na		
1500	1600		USA, WWCR Nashville TN	7490na	9980na	
			13845na	15825na		
1500	1600		USA, WWRB Manchester TN	9385va		
1500	1600		USA, WYFR/Family Radio Worldwide	6280as		
			11830na	11860as	11910na	17795ca
1500	1600		Zambia CVC/ The Voice - Africa	6065af		
			13590af			
1505	1520	m	Austria, Radio Austria International	13775na		
1505	1530	Sat/Sun	Austria, Radio Austria International	13775na		
1515	1530	twhf	Austria, Radio Austria International	13775na		
1515	1545	smtwhf	Swaziland, TWR 4760af	6065af		
1530	1545	mtwhf	Moldova, Radio PMR/Pridnestrovie	7370eu		
1530	1558		Vatican City, Vatican Radio	13765eu	15235eu	
1530	1600	mtwhfa	Albania, Radio Tirana	13720na		
1530	1600		Iran, IRIB	6160as	7330as	
1530	1600		Mongolia, Voice of Mongolia	12085as		
1530	1600		Sweden, Radio Sweden	9360va		
1530	1600		UK, Bible Voice BC	12035as		
1530	1600	mtwhf	UK, Sudan Radio Service	9840af		
1535	1600	Sat/Sun	Austria, Radio Austria International	13775na		
1545	1600	mtwhf	Austria, Radio Austria International	13775na		
1551	1600	DRM	New Zealand, Radio NZ International	6170pa		
1551	1600		New Zealand, Radio NZ International	7145pa		

1600 UTC - 11AM EST / 10AM CST / 8AM PST

1600	1615		Pakistan, Radio Pakistan	9385va	11565va	
			15625af			
1600	1627		Iran, IRIB	6160as	7330as	
1600	1628		Vietnam, Voice of Vietnam	7220va	7280va	
			9550va	9730va		
1600	1630	Sun	Germany, Pan American BC	13830me		
1600	1630		Guam, KSDA/ AWR	11805as	11985as	
1600	1630		Myanmar, Myanma Radio	9730do		
1600	1630		Nigeria, Voice of Nigeria/Lagos	9690af		
1600	1630	Sat/Sun	Swaziland, TWR 6065af			
1600	1630		Yemen, Rep of Yemen Radio	9780me		
1600	1645		USA, WYFR/Family Radio Worldwide	11830na		
			11865na			
1600	1650	DRM	New Zealand, Radio NZ International	6170pa		
1600	1650		New Zealand, Radio NZ International	7145pa		
1600	1657		China, China Radio International	6100af		
			6180me	9570af	9760me	11900af
			11940eu	11965eu	13760eu	
1600	1658		Germany, Deutsche Welle	5965as	9560as	
1600	1700		Anguilla, Worldwide Univ Network	11775am		
1600	1700		Australia, CVC International	13635as		
1600	1700		Australia, Radio Australia	5995va	6080va	
			7240as	9475va	9710pa	11660pa
1600	1700	Sat	Canada, CBC NQ SW Service	9625na		
1600	1700		Canada, CFVP Calgary AB	6030na		
1600	1700		Canada, CKZN St John's NF	6160na		
1600	1700		Canada, CKZU Vancouver BC	6160na		
1600	1700		Costa Rica, Worldwide Univ Network	11870va		
			13750va			
1600	1700		Egypt, Radio Cairo	12170af		
1600	1700		Ethiopia, Radio Ethiopia	7165af	9560af	
1600	1700		France, Radio France International	15605af		
			17605af			
1600	1700	vl	Italy, NEXUS-IBA IRRS	15650af		
1600	1700		Malaysia, RTM/Traxx FM	7295as		
1600	1700		Nigeria, Radio Nigeria/Kaduna	4770do		
1600	1700		North Korea, Voice of Korea	9990va	11545va	
1600	1700	vl	Papua New Guinea, Wantok R. Light	7325va		
1600	1700		Russia, Voice of Russia	4975me	6070as	
			7350as	9405as	9890eu	11985va
			12055as	13855va		
1600	1700	vl	Rwanda, Radio Rwanda	6055do		
1600	1700	vl	Slovakia, Miraya FM Radio	15650af		
1600	1700	vl	Solomon Islands, SIBC	5020do	9545al	
1600	1700		South Korea, KBS World Radio	9515eu		
1600	1700		Taiwan, R Taiwan International	11550as		
			15515as			
1600	1700		Uganda, Dunamis Shortwave	4750af		
1600	1700		UK, BBC World Service	3255af	5975as	
			6190af	9625as	11920as	12095va
			15400af	15420af	17640af	17795af
			17830af	21470af		
1600	1700	Sat/Sun	UK, BBC World Service	7380af		
1600	1700		USA, Armed Forces Radio Network	4319usb		
			5446usb	5765usb	6350usb	7811usb
			10320usb	12133usb	13362usb	
1600	1700		USA, KWHR Naalehu HI	9930as		
1600	1700		USA, Voice of America	4930af	6080af	
			12080va	13600va	13615va	15455va
			15580af	17895va		
1600	1700		USA, WBCQ Monticello ME	9930am		
1600	1700		USA, WBOH Newport NC	5920am		
1600	1700		USA, WEWN Vandiver AL	15855as		
1600	1700		USA, WHRA Greenbush ME	17520af		
1600	1700		USA, WHRI Cypress Creek SC	9495am		
			9840na	11785am		
1600	1700		USA, WINB Red Lion PA	13570am		
1600	1700		USA, WRMI Miami FL	9955am		
1600	1700		USA, WTJC Newport NC	9370na		
1600	1700		USA, WWCR Nashville TN	9980na	12160na	
			13845na	15825na		
1600	1700		USA, WWRB Manchester TN	9385va	12180va	
1600	1700	Sun	USA, WWRB Manchester TN	11920af		
1600	1700		USA, WYFR/Family Radio Worldwide	6085ca		
			13695na	17795ca	18980va	21525af
			21455va			
1600	1700		Zambia CVC/ The Voice - Africa	4965af		
			13590af			
1605	1700		Canada, R Canada International	9610as		
1605	1700	DRM	Canada, R Canada International	9800na		
1615	1629		Vatican City, Vatican Radio	5885eu	7250eu	
			9645eu	15595eu		
1615	1630	mtwhf	Moldova, Radio PMR/Pridnestrovie	7370eu		
1615	1645	mtwhf	Swaziland, TWR 6130af			
1615	1700	Sun	UK, BBC World Service	11860af		
1630	1700	vl	Guam, KSDA/ AWR	11650as		
1630	1700		Nigeria, Voice of Nigeria/Lagos	15120af		
1630	1700	Sat/Sun	Swaziland, TWR 6130af			
1630	1700	Sat	UK, BBC World Service	11860af		
1630	1700	Sun	UK, Bible Voice BC	9460me		
1640	1650	mtwhfa	Turkmenistan, Turkmen Radio	4930eu		
1645	1700		Tajikistan, Tajik Radio	7245as		
1645	1700	mwhfa	UK, Bible Voice BC	9460me		
1651	1700	DRM	New Zealand, Radio NZ International	9890pa		
1651	1700		New Zealand, Radio NZ International	9765pa		

1700 UTC - 12PM EST / 11AM CST / 9AM PST

1700	1715	whfa	UK, Bible Voice BC	9460me		
1700	1720	t	UK, Bible Voice BC	9460me		
1700	1727		Czech Rep, Radio Prague	5930eu	15710af	
1700	1730		Jordan, Radio Jordan	11690na		
1700	1730		USA, Voice of America	6080af	11835af	
			15580af			
1700	1730	Sat	USA, WRMI Miami FL	9955af		
1700	1745		UK, BBC World Service	6005af	9410af	
1700	1750	DRM	New Zealand, Radio NZ International	9890pa		
1700	1750		New Zealand, Radio NZ International	9765pa		
1700	1757		China, China Radio International	6100af		
			6145eu	7130as	7265me	7315me
			7335eu	9570af	9595eu	11900af
			11940eu	13760eu		

1700	1800		Anguilla, Worldwide Univ Network			11775am
1700	1800		Australia, CVC International	13635as		
1700	1800		Australia, Radio Australia	5995va	6080va	
			9475as	9580va	9710as	11880as
1700	1800	Sat	Canada, CBC NQ SW Service	9625na		
1700	1800		Canada, CFVP Calgary AB	6030na		
1700	1800		Canada, CKZN St John's NF	6160na		
1700	1800		Canada, CKZU Vancouver BC	6160na		
1700	1800		Canada, R Canada International			9610as
1700	1800	DRM	Canada, R Canada International			9800na
1700	1800		Costa Rica, Worldwide Univ Network			11870va
			13750va			
1700	1800		Egypt, Radio Cairo	12170af		
1700	1800		Equatorial Guinea, Radio Africa			15190af
1700	1800	vl	Italy, NEXUS-IBA IRRS	15650af		
1700	1800		Malaysia, RTM/Traxx FM	7295as		
1700	1800		Nigeria, Radio Nigeria/Kaduna			4770do
1700	1800		Nigeria, Voice of Nigeria/Lagos			15120af
1700	1800	vl	Papua New Guinea, Wantok R. Light			7325va
1700	1800	Sat	Russia, Voice of Russia	9820eu	9890eu	
1700	1800		Russia, Voice of Russia	4975me	7350as	
			9405as	11510af	11985af	
1700	1800	Sat/Sun	Russia, Voice of Russia	6000eu	7320eu	
			7340eu			
1700	1800	vl	Rwanda, Radio Rwanda	6055do		
1700	1800	vl	Slovakia, Miraya FM Radio	15650af		
1700	1800	vl	Solomon Islands, SIBC	5020eu	9545al	
1700	1800	vl	South Africa, Channel Africa	15235af		
1700	1800		Swaziland, TWR 3200af	9500af		
1700	1800		Taiwan, R Taiwan International			11705af
			15690af			
1700	1800		Uganda, Dunamis Shortwave	4750af		
1700	1800		UK, BBC World Service	3255af	5975as	
			6190af	6195va	7380af	9625as
			12095af	13675af	15400af	17795af
			17830af			
1700	1800	Sun	UK, Bible Voice BC	9460me		
1700	1800		USA, Armed Forces Radio Network			4319usb
			5446usb	5765usb	6350usb	7811usb
			10320usb	12133usb	13362usb	
1700	1800		USA, KWHR Naalehu HI	9930as		
1700	1800	Sat/Sun	USA, Voice of America	15675af		
1700	1800		USA, WBCQ Monticello ME	9330am	15420am	
1700	1800		USA, WBOH Newport NC	5920am		
1700	1800		USA, WEWN Vandiver AL	15855as		
1700	1800		USA, WHRA Greenbush ME	17520af		
1700	1800		USA, WHRI Cypress Creek SC			9495am
			9840na	11785am		
1700	1800		USA, WINB Red Lion PA	13570am		
1700	1800		USA, WRMI Miami FL	9955am		
1700	1800		USA, WTJC Newport NC	9370na		
1700	1800		USA, WWCR Nashville TN	9980na	12160na	
			13845na	15825na		
1700	1800	Sun	USA, WWRB Manchester TN	11920af		
1700	1800		USA, WWRB Manchester TN	9385va	12180va	
1700	1800		USA, WYFR/Family Radio Worldwide			13690na
			17795ca	18980ca	21455va	
1700	1800		Zambia CVC/ The Voice - Africa			4965af
			13590af			
1715	1800		UK, Bible Voice BC	9460me		
1720	1740	Sat/Sun	USA, Voice of America	4930af	11605af	
			13755af	15775af		
1730	1745		UK, Bible Voice BC	9460me		
1730	1757		Vatican City, Vatican Radio	11625af	12765af	
			15570af			
1730	1800		Guam, KSDA/ AWR	9980as		
1730	1800		Slovakia, R Slovakia International			5915eu
			6055eu			
1730	1800		Swaziland, TWR 9500af			
1730	1800	mtwhf	UK, Sudan Radio Service	9840af		
1730	1800		USA, Voice of America	5980va	5995va	
			6080af	9570va	11605va	15410af
			15580af			
1730	1800	mtwhf	USA, Voice of America	4930af	11605af	
			15775af			
1745	1800		Bangladesh, Bangla Betar	7250as		
1745	1800		India, All India Radio	7410eu	9445af	
			9950eu	11620eu	11935af	13605af
			15075af	15155af	17670af	
1751	1800	DRM	New Zealand, Radio NZ International			11675pa
1751	1800		New Zealand, Radio NZ International			11725pa

1800 UTC - 1PM EST / 12PM CST / 10AM PST

1800	1804		Canada, R Canada International			9610as
1800	1804	DRM	Canada, R Canada International			9800na
1800	1809		Tanzania, Tanzania Broadcasting Corp			11735af
1800	1815	vl	UK, Bible Voice BC	9460me		
1800	1827		Czech Rep, Radio Prague	5930eu	9400va	
1800	1828		Vietnam, Voice of Vietnam	9765eu		
1800	1830		Nigeria, Radio, National Svc/Abuja			7275do
1800	1830		Poland, Polish Radio	6015eu	7345eu	
1800	1830	DRM	Romania, R Romania International			5875eu
			5895al			
1800	1830		South Africa, AWR Africa	3215af	3345af	
			11830af			
1800	1830		UK, BBC World Service	5975as		
1800	1830	Sat	UK, Bible Voice BC	9460me		
1800	1830		USA, Voice of America	6080af	15410af	
			15580af	17865af		
1800	1856		Romania, R Romania International			7215eu
			9640eu			
1800	1857		China, China Radio International			7120eu
			9600eu	13760eu		
1800	1859		Canada, R Canada International			7185af
			11875af	13650af	15365af	17790af
1800	1900		Anguilla, Worldwide Univ Network			11775am
1800	1900	mtwhf	Argentina, RAE 15345va			
1800	1900		Australia, Radio Australia	6080va	7240as	
			9475va	9580as	9710as	11880as
1800	1900		Bangladesh, Bangla Betar	7250eu		
1800	1900		Canada, CFVP Calgary AB	6030na		
1800	1900		Canada, CKZN St John's NF	6160na		
1800	1900		Canada, CKZU Vancouver BC	6160na		
1800	1900		Costa Rica, Worldwide Univ Network			11870va
			13750va			
1800	1900		Equatorial Guinea, Radio Africa			15190af
1800	1900		India, All India Radio	7410eu	9445af	
			9950eu	11620eu	11935af	13605af
			15075af	15155af	17670af	
1800	1900		Kuwait, Radio Kuwait	11990va		
1800	1900		Malaysia, RTM/Traxx FM	7295as		
1800	1900		Netherlands, R Netherlands Worldwide			6020af
			11655af	12045af		
1800	1900	DRM	New Zealand, Radio NZ International			11675pa
1800	1900		New Zealand, Radio NZ International			11725pa
1800	1900		Nigeria, Radio Nigeria/Kaduna			4770do
1800	1900		Nigeria, Voice of Nigeria/Lagos			15120af
1800	1900		North Korea, Voice of Korea	3560eu		13760eu
1800	1900	vl	Papua New Guinea, Wantok R. Light			7325va
1800	1900		Russia, Voice of Russia	9480eu	9745af	
			9850af	9890eu		
1800	1900	vl	Rwanda, Radio Rwanda	6055do		
1800	1900	vl	Solomon Islands, SIBC	5020do	9545al	
1800	1900		South Korea, KBS World Radio			7275eu
1800	1900		Swaziland, TWR 3200af	9500af		
1800	1900		Taiwan, R Taiwan International			3965eu
1800	1900		Uganda, Dunamis Shortwave	4750af		
1800	1900		UK, BBC World Service	3255af	5895va	
			5995as	6190af	6195va	7380af
			9485as	12095af	13675va	15400af
			17795af	17830af		
1800	1900	DRM	UK, BBC World Service	5875eu		
1800	1900	Sat	UK, Bible Voice BC	6110me		
1800	1900	Sun	UK, Bible Voice BC	9460me		
1800	1900		USA, Armed Forces Radio Network			4319usb
			5446usb	5765usb	6350usb	7811usb
			10320usb	12133usb	13362usb	
1800	1900		USA, WBCQ Monticello ME	7415am	9330am	
			15420am			
1800	1900		USA, WBOH Newport NC	5920am		
1800	1900		USA, WEWN Vandiver AL	15855as		
1800	1900		USA, WHRA Greenbush ME	17690af		
1800	1900	mtwhf	USA, WHRI Cypress Creek SC			17520af
1800	1900	Sat/Sun	USA, WHRI Cypress Creek SC			9495am
1800	1900		USA, WHRI Cypress Creek SC			9840na
			11785am			
1800	1900		USA, WINB Red Lion PA	13570am		
1800	1900		USA, WRMI Miami FL	9955am		
1800	1900		USA, WTJC Newport NC	9370na		
1800	1900		USA, WWCR Nashville TN	9980na	12160na	
			13845na	15825na		
1800	1900	Sun	USA, WWRB Manchester TN	11920af		
1800	1900		USA, WWRB Manchester TN	9385va	12180va	
1800	1900		USA, WYFR/Family Radio Worldwide			6180va
			13615na	13690na	17795ca	17845af
			18980va			
1800	1900		Yemen, Rep of Yemen Radio	9780me		
1800	1900		Zambia CVC/ The Voice - Africa			4965af
			13590af			
1820	1840	Sat/Sun	USA, Voice of America	4930af	11605af	
			15775af			
1830	1900		Bulgaria, Radio Bulgaria	6200eu	7400eu	
1830	1900		Turkey, Voice of Turkey	9785eu		
1830	1900		UK, BBC World Service	6005af	9410af	
1830	1900		UK, Bible Voice BC	9460me		
1830	1900	Sun	UK, Bible Voice BC	6110me		

1830	1900		USA, Voice of America	4930af	6080af	
			9820va	9520va	9885af	11755va
			11805va	15410af	15580af	17895af
1845	1900		UK, Bible Voice BC	9460me		
1845	1900	Sun	UK, Bible Voice BC	7260af		

1900 UTC - 2PM EST / 1PM CST / 11AM PST

1900	1915	Sun	UK, Bible Voice BC	9460me		
1900	1920	Sun	UK, Bible Voice BC	6015eu		
1900	1925		Turkey, Voice of Turkey	9785eu		
1900	1928		Vietnam, Voice of Vietnam	7280va	9730va	
1900	1929		Germany, Deutsche Welle	11690af		
1900	1930		Germany, Deutsche Welle	9735af	13780af	
			15275af			
1900	1930		UK, Bible Voice BC	9460me		
1900	1930	Sat	UK, Bible Voice BC	7245af	9470me	
1900	1930	mtwhf	USA, Voice of America	11605af	15775af	
1900	1945		India, All India Radio	7410eu	9445af	
			9950eu	11620eu	11935af	13605af
			15075af	15155af	17670af	
1900	1945	Sat	UK, Bible Voice BC	6015eu		
1900	1945	Sun	UK, Bible Voice BC	9470me		
1900	1945		USA, WYFR/Family Radio Worldwide	6085ca		
1900	1950		New Zealand, Radio NZ International	11725pa		
1900	1950	DRM	New Zealand, Radio NZ International	11675pa		
1900	1957		China, China Radio International	7295va		
			9435va			
1900	2000		Anguilla, Worldwide Univ Network	11775am		
1900	2000		Australia, Radio Australia	6080va	7240as	
			9500va	9580va	9710as	11880as
1900	2000		Canada, CFVP Calgary AB	6030na		
1900	2000		Canada, CKZN St John's NF	6160na		
1900	2000		Canada, CKZU Vancouver BC	6160na		
1900	2000		Costa Rica, Worldwide Univ Network	11870va		
			13750va			
1900	2000		Egypt, Radio Cairo	9300af		
1900	2000		Equatorial Guinea, Radio Africa	15190af		
1900	2000		Germany, Overcomer Ministries	6175eu		
1900	2000		Iran, IRIB	6160as	7330as	
1900	2000	fas	Italy, NEXUS-IBA IRRS	7290va		
1900	2000		Kuwait, Radio Kuwait	11990va		
1900	2000		Malaysia, RTM/Traxx FM	7295as		
1900	2000		Netherlands, R Netherlands Worldwide	7120af		
			11655af	11805af	12045af	
1900	2000		Nigeria, Radio Nigeria/Kaduna	4770do		
1900	2000		Nigeria, Voice of Nigeria/Lagos	15120af		
1900	2000		North Korea, Voice of Korea	7100af	9975va	
			11535va	11910af		
1900	2000	vl	Papua New Guinea, Wantok R. Light	7325va		
1900	2000		Russia, Voice of Russia	7310eu	7195eu	
			7310eu			
1900	2000	vl	Rwanda, Radio Rwanda	6055do		
1900	2000	vl	Solomon Islands, SIBC	5020do		
1900	2000	vl	South Africa, Channel Africa	3345af		
1900	2000		Swaziland, TWR 3200af	9500af		
1900	2000		Thailand, Radio Thailand World Svc	7155eu		
1900	2000	vl	Uganda, UBC Radio	4976do	5026do	
1900	2000		UK, BBC World Service	3255af	5875va	
			5995as	6005af	6190af	9410af
			9485as	12095af	15400af	17795af
			17830af			
1900	2000	DRM	UK, BBC World Service	5875eu		
1900	2000	Sun	UK, Bible Voice BC	7260af		
1900	2000		USA, Armed Forces Radio Network	4319usb		
			5446usb	5765usb	6350usb	7811usb
			10320usb	12133usb	13362usb	
1900	2000		USA, KJES Vado NM	15385na		
1900	2000		USA, Voice of America	4930af	6080af	
			7480va	9670va	9885af	15410af
			15580af	17895af		
1900	2000		USA, WBCQ Monticello ME	7415am	9330am	
			15420am			
1900	2000		USA, WBOH Newport NC	5920am		
1900	2000		USA, WEWN Vandiver AL	17595af		
1900	2000		USA, WHRA Greenbush ME	17690af		
1900	2000	Sat	USA, WHRI Cypress Creek SC	9495am		
1900	2000		USA, WHRI Cypress Creek SC	11785am		
1900	2000		USA, WINB Red Lion PA	13570am		
1900	2000		USA, WRMI Miami FL	9955am		
1900	2000		USA, WTJC Newport NC	9370na		
1900	2000		USA, WWCR Nashville TN	9980na	12160na	
			13845na	15825na		
1900	2000		USA, WWRB Manchester TN	9385va	12180va	
1900	2000		USA, WYFR/Family Radio Worldwide	3230af		
			9775af	11775eu	13695na	13690ca
			17795af	17845eu	18930eu	18980va
1900	2000		Zambia CVC/ The Voice - Africa	4965af		
			13590af			
1905	2000	Mon	South Africa, SA Radio League	3215af		
1930	2000	fas	Germany, Pan American BC	9515af		
1930	2000		Iran, IRIB	6010eu	7260eu	7320eu
			9855af	11695af		
1930	2000		Slovakia, R Slovakia International	5915eu		
			7345eu			
1930	2000		UK, Bible Voice BC	9470me		
1945	2000	mtwhfa	Albania, Radio Tirana	7465eu	11645na	
1945	2000	DRM	Vatican City, Vatican Radio	9800na		
1950	2000		Vatican City, Vatican Radio	5885eu	7250eu	
			9645eu			
1951	2000	DRM	New Zealand, Radio NZ International	15720pa		
1951	2000		New Zealand, Radio NZ International	17675pa		

2000 UTC - 3PM EST / 2PM CST / 12PM PST

2000	2005	Mon	South Africa, SA Radio League	3215af		
2000	2015	Sun	Germany, Pan American BC	9515af		
2000	2019		Vatican City, Vatican Radio	5885eu	7250eu	
			9645eu			
2000	2019	DRM	Vatican City, Vatican Radio	9800na		
2000	2027		Iran, IRIB	6010eu	7260eu	7320eu
			9855af	11695af		
2000	2027		Vatican City, Vatican Radio	7365af	9755af	
			11625af			
2000	2030		China, China Radio International	7160eu		
2000	2030		Egypt, Radio Cairo	9300af		
2000	2030	fa	Germany, Pan American BC	9515af		
2000	2030		South Africa, AWR Africa	9655af		
2000	2030		USA, Voice of America	4930af	4940af	
			6080af	15580af	17895af	
2000	2045		Swaziland, TWR 3200af			
2000	2045		USA, WYFR/Family Radio Worldwide	17750eu		
2000	2057		China, China Radio International	5960eu		
			5985af	7190eu	7285eu	7295va
			9440va	9660eu		
2000	2057		Germany, Deutsche Welle	9735af		
2000	2058		Germany, Deutsche Welle	13780af		
2000	2059		Germany, Deutsche Welle	9545af	15275af	
2000	2100		Anguilla, Worldwide Univ Network	11775am		
2000	2100		Australia, ABC NT Alice Springs	2310do		
			4835do			
2000	2100		Australia, ABC NT Katherine	2485do		
2000	2100		Australia, ABC NT Tennant Creek	2325do		
2000	2100	Sat/Sun	Australia, Radio Australia	6080va	7240as	
			12080as			
2000	2100		Australia, Radio Australia	9500va	11650as	
			11660pa	11880as		
2000	2100		Belarus, Radio Minsk	7105eu	7360eu	
			7390eu			
2000	2100		Canada, CFVP Calgary AB	6030na		
2000	2100		Canada, CKZN St John's NF	6160na		
2000	2100		Canada, CKZU Vancouver BC	6160na		
2000	2100		Costa Rica, Worldwide Univ Network	13750va		
2000	2100		Equatorial Guinea, Radio Africa	15190af		
2000	2100		Germany, Overcomer Ministries	5995eu		
			6175eu			
2000	2100	fas	Italy, NEXUS-IBA IRRS	7290va		
2000	2100		Kuwait, Radio Kuwait	11990va		
2000	2100	vl	Liberia, ELWA 4760do			
2000	2100		Malaysia, RTM/Traxx FM	7295as		
2000	2100		Netherlands, R Netherlands Worldwide	7120af		
			11655af	17810af		
2000	2100		New Zealand, Radio NZ International	17675pa		
2000	2100	DRM	New Zealand, Radio NZ International	15720pa		
2000	2100		Nigeria, Radio Nigeria/Kaduna	4770do		
2000	2100		Nigeria, Voice of Nigeria/Lagos	15120af		
2000	2100	vl	Papua New Guinea, R East New Britain	3385do		
2000	2100	vl	Papua New Guinea, Wantok R. Light	7325va		
2000	2100		Russia, Voice of Russia	7195eu	9890eu	
2000	2100	vl	Rwanda, Radio Rwanda	6055do		
2000	2100	vl	South Africa, Channel Africa	3345af		
2000	2100	mtwhf	Spain, Radio Exterior Espana	9665eu	11620af	
2000	2100	vl	Uganda, UBC Radio	4976do	5026do	
2000	2100		UK, BBC World Service	3255af	5875va	
			6005af	6190af	9410af	12095af
			13820af	15400af	17830af	
2000	2100	DRM	UK, BBC World Service	5875eu		
2000	2100		Ukraine, R Ukraine International	7510eu		
2000	2100		USA, Armed Forces Radio Network	4319usb		
			5446usb	5765usb	6350usb	7811usb
			10320usb	12133usb	13362usb	
2000	2100		USA, WBCQ Monticello ME	7415am	9330am	
			15420am			
2000	2100		USA, WBOH Newport NC	5920am		
2000	2100		USA, WEWN Vandiver AL	17595af		
2000	2100	mtwhf	USA, WHRA Greenbush ME	7520va		

2000	2100	Sat/Sun	USA, WHRA Greenbush ME	11885va		
2000	2100	f	USA, WHRI Cypress Creek SC			17650am
2000	2100	asmtwh	USA, WHRI Cypress Creek SC			9495am
2000	2100		USA, WINB Red Lion PA	13570am		
2000	2100		USA, WRMI Miami FL	9955am		
2000	2100		USA, WTJC Newport NC	9370na		
2000	2100		USA, WWCR Nashville TN	9980na	12160na	
			13845na	15825na		
2000	2100	Sun	USA, WWRB Manchester TN	11920af		
2000	2100		USA, WWRB Manchester TN	9385va	12180va	
2000	2100		USA, WYFR/Family Radio Worldwide			7430eu
			9485af	9625af	9635af	11970eu
			13625af	17725sa	17795ca	17845af
			18910va			
2000	2100		Zambia CVC/ The Voice - Africa			4965af
			13590af			
2030	2045		Thailand, Radio Thailand World Svc			9680eu
2030	2058		Vietnam, Voice of Vietnam	7220va		7280va
			9550va	9730va		
2030	2100		Cuba, Radio Havana Cuba	9505va		11760va
2030	2100		Sweden, Radio Sweden	9895va		
2030	2100		Turkey, Voice of Turkey	7170va		
2030	2100		USA, Voice of America	4930af		6080af
			7555as	15580af	17895af	
2030	2100	Sat/Sun	USA, Voice of America	11720af		
2045	2100		India, All India Radio	7410eu		9445eu
			9910pa	9950eu	11620va	11715pa

2100 UTC - 4PM EST / 3PM CST / 1PM PST

2100	2125		Turkey, Voice of Turkey	7170pa		
2100	2127		China, China Radio International			11640af
			13630af			
2100	2127		Czech Rep, Radio Prague	5930eu		9430va
2100	2130	mtwhfa	Albania, Radio Tirana	7510eu		9345na
2100	2130		Australia, ABC NT Katherine	2485do		
2100	2130		Australia, ABC NT Tennant Creek			2325do
2100	2130		Austria, AWR-Europe	9830af		
2100	2130	Sat	Canada, CBC NQ SW Service	9625na		
2100	2130		Cuba, Radio Havana Cuba	9505va		11760va
2100	2130		Nigeria, Radio, National Svc/Abuja			7275do
2100	2130		South Africa, AWR Africa	11955af		
2100	2130		South Korea, KBS World Radio			3955eu
2100	2145		USA, WYFR/Family Radio Worldwide			13615na
			13690na	17795ca	18980va	
2100	2157		China, China Radio International			5960eu
			6135eu	7190eu	7285eu	7325af
			9600eu			
2100	2157		Germany, Deutsche Welle	13780af		
2100	2159		Germany, Deutsche Welle	7280af		
2100	2200		Angola, Radio Nacional de Angola			7217do
2100	2200		Anguilla, Worldwide Univ Network			11775am
2100	2200		Australia, ABC NT Alice Springs			2310do
			4835do			
2100	2200		Australia, Radio Australia	9500as		9660as
			11650pa	11660pa	11695as	12080as
			13630as	15515as		
2100	2200		Belarus, Radio Minsk	7105eu		7390eu
2100	2200		Canada, CFVP Calgary AB	6030na		
2100	2200		Canada, CKZN St John's NF	6160na		
2100	2200		Canada, CKZU Vancouver BC	6160na		
2100	2200		Costa Rica, Worldwide Univ Network			13750va
2100	2200		Equatorial Guinea, Radio Africa			15190af
2100	2200		Germany, Deutsche Welle	9545af		11690af
2100	2200		Germany, Overcomer Ministries			5995eu
2100	2200		Guyana, Voice of Guyana	3291do		
2100	2200		India, All India Radio	7410eu		9445eu
			9950pa	11620eu		
2100	2200	vl	Liberia, ELWA	4760do		
2100	2200		Malaysia, RTM/Traxx FM	7295as		
2100	2200		New Zealand, Radio NZ International			17675pa
2100	2200	DRM	New Zealand, Radio NZ International			15720pa
2100	2200		Nigeria, Radio Nigeria/Kaduna			4770do
2100	2200		Nigeria, Voice of Nigeria/Lagos			7255af
2100	2200		North Korea, Voice of Korea	7560eu		13760eu
			15245eu			
2100	2200	vl	Papua New Guinea, Wantok R. Light			7325va
2100	2200	vl	South Africa, Channel Africa	3345af		
2100	2200	Sat/Sun	Spain, Radio Exterior Espana	9840eu		
2100	2200		Syria, Radio Damascus	9330eu		
2100	2200		UK, BBC World Service	3255af		3915as
			5875va	5905as	6005af	6190af
			6195as	7120af	15400af	
2100	2200	DRM	UK, BBC World Service	5875eu		
2100	2200		USA, Armed Forces Radio Network			4319usb
			5446usb	5765usb	6350usb	7811usb
			10320usb	12133usb	13362usb	
2100	2200		USA, Voice of America	6080af		7555as
			15580af			
2100	2200		USA, WBCQ Monticello ME	7415am		9330am
			15420am			
2100	2200		USA, WBOH Newport NC	5920am		
2100	2200		USA, WEWN Vandiver AL	17595af		
2100	2200		USA, WHRA Greenbush ME	11885va		
2100	2200		USA, WHRI Cypress Creek SC			11785am
			15665na			
2100	2200		USA, WINB Red Lion PA	13570am		
2100	2200		USA, WRMI Miami FL	9955am		
2100	2200		USA, WTJC Newport NC	9370na		
2100	2200		USA, WWCR Nashville TN	7465na	9980na	
			12160na	13845na		
2100	2200	Sun	USA, WWRB Manchester TN	11920af		
2100	2200		USA, WWRB Manchester TN	9385va	12180va	
2100	2200		USA, WYFR/Family Radio Worldwide			3230af
			7430eu	11565eu	17845af	
2100	2200		Zambia CVC/ The Voice - Africa			4965af
2115	2200		Egypt, Radio Cairo	11550eu		
2130	2156		Romania, R Romania International			6030eu
			6115na	7145na	9755na	
2130	2200		Australia, ABC NT Katherine	5025do		
2130	2200		Australia, ABC NT Tennant Creek			4910do
2130	2200	mtwhfa	Canada, CBC NQ SW Service	9625na		
2130	2200		Guam, KSDA/ AWR	11850as		
2130	2200		Lithuania, Mighty KBC Radio	6055eu		
2130	2200		Sweden, Radio Sweden	7395va		

2200 UTC - 5PM EST / 4PM CST / 2PM PST

2200	2229		Lithuania, Mighty KBC Radio	6055eu		
2200	2230		India, All India Radio	9910pa		11620pa
			11715pa			
2200	2230		Japan, NHK World Radio Japan			13640va
2200	2235		New Zealand, Radio NZ International			17675pa
2200	2235	DRM	New Zealand, Radio NZ International			15720pa
2200	2245		Egypt, Radio Cairo	11550eu		
2200	2245		USA, WYFR/Family Radio Worldwide			15770af
2200	2255		Turkey, Voice of Turkey	6195va		
2200	2257		China, China Radio International			7175eu
2200	2300		Anguilla, Worldwide Univ Network			6090am
2200	2300		Australia, ABC NT Alice Springs			2310do
			4835do			
2200	2300		Australia, ABC NT Katherine	5025do		
2200	2300		Australia, ABC NT Tennant Creek			4910do
2200	2300		Australia, Radio Australia	11840va		12010va
			13630pa	15230va	15240pa	15515as
			17785pa			
2200	2300		Bulgaria, Radio Bulgaria	6200eu		7400eu
2200	2300	smtwhf	Canada, CBC NQ SW Service	9625na		
2200	2300		Canada, CFVP Calgary AB	6030na		
2200	2300		Canada, CKZN St John's NF	6160na		
2200	2300		Canada, CKZU Vancouver BC	6160na		
2200	2300		China, China Radio International			9590as
2200	2300		Costa Rica, Worldwide Univ Network			13750va
2200	2300		Equatorial Guinea, Radio Africa			15190af
2200	2300		Guyana, Voice of Guyana	3291do		
2200	2300	vl	Liberia, ELWA	4760do		
2200	2300		Malaysia, RTM/Traxx FM	7295as		
2200	2300		Nigeria, Radio Nigeria/Kaduna			4770do
2200	2300		Nigeria, Voice of Nigeria/Lagos			7255af
2200	2300	vl	Papua New Guinea, Wantok R. Light			7325va
2200	2300		Taiwan, R Taiwan International			9355eu
2200	2300		UK, BBC World Service	5905as		5975as
			6005af	6195as	9740as	12095af
			15400af			
2200	2300		Ukraine, R Ukraine International			5830eu
2200	2300		USA, Armed Forces Radio Network			4319usb
			5446usb	5765usb	6350usb	7811usb
			10320usb	12133usb	13362usb	
2200	2300		USA, Voice of America	5895va		5915va
			7120va	7460as	7555va	9415va
			11725va	15185va		
2200	2300		USA, WBCQ Monticello ME	7415am		9330am
2200	2300		USA, WBOH Newport NC	5920am		
2200	2300		USA, WEWN Vandiver AL	15665af		
2200	2300		USA, WHRA Greenbush ME	11855va		
2200	2300		USA, WHRI Cypress Creek SC			7385na
			9615na	11785am		
2200	2300		USA, WINB Red Lion PA	9265am		
2200	2300		USA, WRMI Miami FL	9955am		
2200	2300		USA, WTJC Newport NC	9370na		
2200	2300		USA, WWCR Nashville TN	5070na	7465na	
			9980na	13845na		
2200	2300		USA, WWRB Manchester TN	5050na	6890va	
			9385va	12180va		

2200	2300		USA, WYFR/Family Radio Worldwide			5950na
			11740na	15440na		
2200	2300		Zambia CVC/ The Voice - Africa			4965af
2230	2257		Czech Rep, Radio Prague		5930na	9435af
2230	2300		Guam, KSDA/ AWR		15320as	
2230	2300		Sweden, Radio Sweden		5850va	
2230	2300		USA, Voice of America		9570va	11705va
			15145va			
2236	2300		New Zealand, Radio NZ International			15720pa
2236	2300	DRM	New Zealand, Radio NZ International			17675pa
2245	2300		India, All India Radio		9705eu	9950as
			11620as	11645as	13605as	

2300 UTC - 6PM EST / 5PM CST / 3PM PST

2300	0000		Anguilla, Worldwide Univ Network			6090am
2300	0000		Australia, ABC NT Alice Springs			2310do
			4835do			
2300	0000		Australia, ABC NT Katherine		5025do	
2300	0000		Australia, ABC NT Tennant Creek			4910do
2300	0000		Australia, Radio Australia		9660as	11840va
			12010pa	12080pa	13690pa	15230va
			15240pa	15560va	17785pa	17795va
2300	0000	smtwhf	Canada, CBC NQ SW Service		9625na	
2300	0000		Canada, CFVP Calgary AB		6030na	
2300	0000		Canada, CKZN St John's NF		6160na	
2300	0000		Canada, CKZU Vancouver BC		6160na	
2300	0000		China, China Radio International			5915as
			5990am	6145na	7180as	9460as
			11690as	11970ca		
2300	0000	DRM	China, China Radio International			9800ca
2300	0000		Costa Rica, Worldwide Univ Network			13750va
2300	0000		Cuba, Radio Havana Cuba		9505am	9550am
2300	0000		Egypt, Radio Cairo		9280na	
2300	0000		Guyana, Voice of Guyana		3291do	
2300	0000		India, All India Radio		9950as	11645as
			13605as			
2300	0000		Iran, IRIB	6010eu	7260eu	7320eu
			9855af	11695af		
2300	0000		Malaysia, RTM/Traxx FM		7295as	
2300	0000		New Zealand, Radio NZ International			15720pa
2300	0000	DRM	New Zealand, Radio NZ International			17675pa
2300	0000	vl	Papua New Guinea, Wantok R. Light			7325va
2300	0000		UK, BBC World Service		3915as	5965as
			6195as	9740as	9885as	11850as
			12010as			
2300	0000		USA, Armed Forces Radio Network			4319usb
			5446usb	5765usb	6350usb	7811usb
			10320usb	12133usb	13362usb	
2300	0000		USA, Voice of America		5895va	5915va
			7120as	7555as	9415va	9570va
			11725va	13755va	15145va	15185va
2300	0000		USA, WBCQ Monticello ME		7415am	9330am
2300	0000		USA, WBOH Newport NC		5920am	
2300	0000		USA, WEWN Vandiver AL		15665af	
2300	0000		USA, WHRA Greenbush ME		5850eu	
2300	0000		USA, WHRI Cypress Creek SC			7315na
			9615na	11785am		
2300	0000	mtwhfa	USA, WHRI Cypress Creek SC			11785na
2300	0000		USA, WHRI Cypress Creek SC			7315am
2300	0000		USA, WRMI Miami FL		9955am	
2300	0000		USA, WTJC Newport NC		9370na	
2300	0000		USA, WWCR Nashville TN		5070na	7465na
			9980na	13845na		
2300	0000		USA, WWRB Manchester TN		5050na	6890va
			9385va	12180va		
2300	0000		USA, WYFR/Family Radio Worldwide			5950na
			15255sa	15440sa	17750sa	
2300	0000		Zambia CVC/ The Voice - Africa			4965af
2300	2304	vl	Croatia, Croatian Radio		7375va	
2300	2305	vl	Liberia, ELWA	4760do		
2300	2315	mtwhf	Moldova, Radio PMR/Pridnestrovie			6040va
2300	2315		Nigeria, Radio Nigeria/Kaduna			4770do
2300	2327		Vatican City, Vatican Radio		9600va	12035va
2300	2330		Australia, Radio Australia		15240pa	
2300	2345		USA, WYFR/Family Radio Worldwide			11740na
2300	2356		Romania, R Romania International			6015eu
			6115eu	7105eu	9610na	
2305	0000	Sun	Greece, Voice of Greece		7475eu	9420eu
2330	0000		Australia, Radio Australia		15415as	17750va
2330	0000		Lithuania, Radio Vilnius		9875na	
2330	0000		UK, BBC World Service		9580as	
2330	0000		USA, Voice of America		7350va	9570va
			13755va	15145va	15340va	
2330	2357		Czech Rep, Radio Prague		5930na	7345na
2330	2358		Vietnam, Voice of Vietnam		9840as	12020as

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Albania, Radio Tirana ..... http://rtsh.sil.at/
Angola, Radio Nacional de Angola ..... www.rna.ao/
Anguilla, Worldwide Univ Network ..... www.worldwideuniversitynetwork.com/
Argentina, RAE ..... www.radionacional.gov.ar/rae/rae.asp
Australia, ABC NT Alice Springs ..... www.abc.net.au/radio/
Australia, ABC NT Katherine ..... www.abc.net.au/radio/
Australia, ABC NT Tennant Creek ..... www.abc.net.au/radio/
Australia, CVC International ..... www.christianvision.com/
Australia, HCJB Global ..... www.hcjb.org/
Australia, Radio Australia ..... www.abc.net.au/ra/
Austria, AWR Europe www.awr2.org/
Austria, Radio Austria Intl http://oe1.orf.at/service/international
Bahrain, Radio Bahrain ..... www.radiobahrain.net/
Bangladesh, Bangla Betar ..... www.betar.org.bd/
Belarus, Radio ..... www.radiobelarus.tvr.by/eng/
Bhutan, BBS ..... www.bbs.com.bt/
Bulgaria, Radio ..... www.bnr.bg/
Canada, CBC NQ SW Service ..... www.cbc.ca/north/
Canada, Radio Canada Intl ..... www.rcinet.ca/
China, China Radio Intl ..... www.cri.cn/
Costa Rica, Worldwide Univ Network ..... www.worldwideuniversitynetwork.com/
Croatia, Croatian Radio ..... www.hrt.hr/
Cuba, Radio Havana ..... www.radiohc.cu/
Czech Rep, Radio Prague ..... www.radio.cz/en/
Finland, Overcomer Ministries ..... www.overcomerministries.org
France, Radio France Intl ..... http://rfienglish.com
Germany, AWR Europe www.awr2.org/
Germany, CVC Intl/Voice Africa ..... www.christianvision.com/
Germany, Deutsche Welle ..... www.dw-world.de/
Germany, Overcomer Ministries ..... www.overcomerministry.org/
Germany, Pan American BC ..... www.radiopanam.com/
Germany, The Overcomer Ministries ..... www.overcomerministry.org/
Germany, TWR Europe ..... www.twr.org/
Greece, Voice of Greece ..... www.voiceofgreece.gr/
Guam, AWR/KSDA www.awr2.org/
Guam, TWR/KTWR ..... www.twr.org/
Guyana, Voice of ..... http://voiceofguyana.com/
India, All India Radio ..... www.allindiaradio.org/
Indonesia, Voice of Indonesia ..... www.rri-online.com/
Iran, Voice of the Islamic Rep of Iran www2.irib.ir/worldservice/
Italy, IRRS ..... www.nexus.org
Japan, NHK World/Radio Japan ..... www.nhk.or.jp/english/
Jordan, Radio ..... www.jrtv.jo/rj/index.php
Latvia, Radio SWH ..... www.radioswh.lv/index.php
Liberia, ELWA ..... www.elwaministries.org/
Liberia, Star Radio ..... www.radioswh.lv/index.php
Libya, Voice of Africa ..... www.ljbc.net/home.php
Lithuania, Radio Vilnius ..... www.lrt.lt/
Malaysia, RTM/Traxx FM ..... www.traxxfm.net/index.htm
Malaysia, RTM/Voice of Malaysia http://202.190.233.9/vom/utama.htm
Monaco, TWR Europe ..... www.twr.org/
Nepal, Radio Nepal ..... www.radionepal.org/
Netherlands, Radio Netherlands ..... www.radionetherlands.nl/
New Zealand, Radio NZ Intl ..... www.rnzi.com
Nigeria, Radio, Natl Svc/Abuja ..... http://radionigeriaonline.com
Nigeria, Radio/Kaduna ..... http://radionigeriaonline.com
Nigeria, Voice of/ Ext. Svc Lagos ..... www.voiceofnigeria.org
Oman, Radio Oman ..... www.oman-tv.gov.om
Pakistan, Radio ..... www.radio.gov.pk
Papua New Guinea, NBC ..... www.nbc.com.pg/
Papua New Guinea, Wantok R. Light ..... http://wantokradio.net/
Philippines, Radio Pilipinas ..... www.radiopilipinas.com/
Poland, Polish Radio ..... www.polskieradio.pl/zagranica/gb/
Romania, Radio Romania Intl ..... www.rri.ro/
Russia, Voice of Russia ..... www.vor.ru/world.html
Saudi Arabia, BSKSA ..... www.saudiradio.net/
Slovakia, Radio Slovakia Int ..... www.rsi.sk
Solomon Islands, SIBC ..... www.sibconline.com.sb/
South Africa, AWR Africa www.awr2.org/
South Africa, Channel Africa ..... www.channelafrica.org
South Africa, Trans World Radio ..... www.twr.org/
South Korea, KBS World Radio ..... http://rki.kbs.co.kr/english/
Spain, Radio Exterior Espana ..... www.ree.rne.es/
Sri Lanka, SLBC ..... www.slbc.lk
Swaziland, Trans World Radio ..... www.twr.org/
Sweden, Radio ..... www.sr.se/rs/english/
Syria, Radio Damascus ..... www.rtv.gov.sy/
Taiwan, Radio Taiwan Intl ..... http://english.rti.org.tw/
Thailand, Radio www.hsk9.com/
Turkey, Voice of ..... www.trt,net.tr
UK, BBC World Service ..... www.bbc.co.uk/worldservice/
UK, Bible Voice BC ..... www.biblevoice.org/
UK, FEBA ..... www.feba.org.uk
UK, Sudan Radio Service ..... www.sudanradio.org/
Ukraine, Radio Ukraine Intl ..... www.nrcu.gov.ua/
USA, American Forces Radio ..... http://myafn.dodmedia.osd.mil/
USA, KNLS Anchor Point AK ..... www.knls.org/
USA, KTBN Salt Lake City UT ..... www.tbn.org/
USA, KWHR Naalehu HI ..... www.whr.org/
USA, Voice of America ..... www.voanews.com/
USA, WBCQ Monticello ME ..... www.wbcq.com/
USA, WBOH Newport NC ..... www.fbnradio.com/
USA, WEWN Vandiver AL ..... www.ewtn.com
USA, WHRA Greenbush ME ..... www.whr.org/
USA, WHRI Cypress Creek SC ..... www.whr.org/
USA, WINB Red Lion PA ..... www.winb.com/
USA, WRMI Miami FL ..... www.wrmi.net/
USA, WTJC Newport NC ..... www.fbnradio.com/
USA, WWCR Nashville TN ..... www.wwcr.com
USA, WWRB Manchester TN ..... www.wwrb.org/
USA, WYFR/Family Radio Worldwide ..... www.worldwide.familyradio.org
Uzbekistan, CVC International ..... www.christianvision.com/
Vatican City, Vatican Radio ..... www.vaticanradio.org
Vietnam, Voice of Vietnam ..... www.vov.org.vn
Yemen, Rep of Yemen Radio ..... www.yemenradio.net
Zambia, CVC Intl/Christian Voice ..... www.christianvision.com/

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Monitoring the Military Command Post

This month we are going to finish the year with Part Two of our Military Command Post frequency list. This should give you quite a bit to monitor as we roll into 2009. Part One of this listing appeared in the September 2008 *MT Milcom* column.

The base command post is the heart of all operations on a military base. On most bases it is the place were many people go for information. And it is an entity that can be monitored via radio.

While the U.S. Air Force is the primary user of the command post concept, the other military services have their own equivalents to the Air Force command post. In addition to the individual unit air-to-ground frequencies, the U.S. Navy uses base operations frequencies at most of their bases. The U.S. Army equivalent is usually identified as an "operations" frequency for the major unit(s) hosted on their airfields.

So, where can you monitor military command post communications? Here is our latest list of command post and callsigns (Command and Control, or C2) compiled from official government publications/listings. All frequencies are MHz unless otherwise indicated. Remember, you do not have to be within ground range of any of these listings in order to hear communications on these line of sight frequencies. If an aircraft is in range of the military ground station and your monitor post, you will be able to hear at least one side of the communications.

MILITARY COMMAND AND CONTROL FREQUENCIES/CALLSIGNS

Jackson Evers Intl, MS	ANG Command Post: 264.600 (172nd MAG CP)
Jacksonville Intl, FL	ANG Command Post: 251.250 (Fang Command Post); ANG Maintenance: 251.250 (Goodwrench); ANG Safety of Flight: 273.900 (Fang SOF)
Jacksonville NAS, FL	Base Operations: 134.775 310.200
Jefferson City Memorial, MO	NG Operations: 41.650 142.400 242.400
Joe Foss Field, SD	ANG Operations/Maintenance: 253.400 (Lobo Ops/Maintenance)
John Murtha Johnstown Cambria County, PA	Operations: 40.800 139.150 241.350 (Keystone Ops)
Keesler AFB, MS	403 AG AFRC Command Post: 252.800 (Accountant); Aeromedical Evac: 236.600
Key Field, MS	ANG Ops/Command Post: 8989.0 kHz USB 292.300
Key West NAS, FL	Base Operations: 338.000
Kingsville NAS, TX	Base Operations: 274.800
Kirtland AFB, NM	AMC Command Post: 349.400; Base Operations: 372.200
Klamath Falls, OR	ANG Base Operations: 388.950 (Beaver Ops)
Lackland AFB (Kelly Field Annex), TX	433AW AFRC Command Post: 143.800 252.100
Laguna AAF, AZ	AAS: 126.200 242.175
Lambert St. Louis Intl, MO	Boeing Flight Ops: 123.200 382.600 (MAC Ops); ANG Operations: 297.900 (Banjo Ops)
Langley AFB, VA	Consolidated Command Post: 251.250 311.000 (Raymond 16); NASA Operations: 123.375 310.400
Laurence G. Hanscom Field, MA	Command Post: 397.100
Lawson AAF, GA	Pilot-to-Dispatcher/Base Operations: 134.100 245.700
Lemoore NAS, CA	Base Operations: 299.300
Lincoln, NE	ANG: 6751.0 USB 234.650 (Huskr Control); NG Operations: 123.075 38.800
Little Rock AFB, AR	Command Post: 349.400; ANG Command Post: 138.600 225.450
Long Island MacArthur, NY	NG Operations: 45.000 242.400
Los Alamitos AAF, CA	Army Operations: 139.050 230.900; NG AASF Operations: 41.500 233.800
Los Angeles Intl, CA	AF Operations: 372.200 (Orbit Ops); CG Operations: 345.000 (3120.0 5692.0 8980.0 8984.0 USB) LA Air
Louisville Intl, KY	ANG Operations: 268.100
Lovell Field, TN	NG Operations: 41.500 149.800 373.900
Luke AFB, AZ	Command Post: 349.400 (Raymond 18)
MacDill AFB, FL	6AMW Command Post: 138.950 311.000 321.000 (Lightning Ops)
Majors, TX	AFMCLO Flight: 349.600 (Same Control) 15048.0 kHz USB
Mansfield Lahm Regional, OH	ANG Command Post: 297.500 (Herc CP)
March ARB, CA	Command Post: 311.000 349.400
Marshall AAF, KS	Operations: 40.550
Martin State, MD	175 Wing Command Post: 347.200 384.100 A-10 (Raven Ops); 175 Wing Command Post: 384.100 C-130 (Crab Ops)
Maxwell AFB, AL	42ABW Command Post: 234.600; AFRC 908AW Command Post: 396.900 (Toil Ops)
McChord AFB, WA	Command Post: 349.400 (134.100 Contract aircraft only)
McClellan Airfield, CA	CG Sacramento: 167.900 237.900
McConnell AFB, KS	Command Post: 311.000 321.000; ANG Operations: 301.600
McEntire JNGB, SC	ANG Pilot-to-Dispatcher/Operations: 125.125 298.300; NG Pilot-to-Dispatcher/Operations: 41.300 246.700
McGhee Tyson, TN	ANG Operations: 303.000 (Soda Ops); NG Operations: 41.500 149.800 373.900
McGuire AFB, NJ	Base Command Post: 319.400 349.400; 108 ANG Command Post: 303.000 (Torch Control); Army Operations: 41.350 139.300 265.600
McKellar Sipes Regional, TN	NG Operations: 41.500 138.750 373.900
McNary Field, OR	Guard Operations: 40.900 135.000 241.600 (KLSE OSA Ops)
Melbourne Intl, FL	Grumman Ops: 123.200
Memphis Intl, TN	ANG Command Post: 138.950 341.750
Meridian NAS, MS	Base Ops: 352.200
Minneapolis-St. Paul Intl, MN	934AW Command Post: 252.100 (Abstain); 433AW Command Post/Operations: 324.300 (Cactus); 934AW Base Operations: 282.675 (Viking Ops)
Minot AFB, ND	Command Post: 321.000 (Raymond 12)
Mobile Regional, AL	CG Operations: 345.000 (Mobile Air) 3123.0 5696.0 8984.0 kHz USB; NG Operations: 41.050 125.525 242.400
Moffett Federal Airfield, CA	Base Operations: 251.700; ANG Operations: 390.900 (SQ Ops) 5711.0 kHz USB (Moffett Rescue)
Montgomery Regional, AL	ANG Operations: 276.800 (Bama Ops); NG Operations: 38.200 149.775 226.350
Moody AFB, GA	Command Post: 228.225 381.050 (Angel Ops); Safety of Flight: 143.825 305.600
Mountain Home AFB, ID	ACC Command Post: 311.000 (Have Quick timing) 381.300 (Raymond 27) 15091.0 kHz USB
Muir AAF, PA	NG Operations: 40.900
Muldrow AHP, OK	Operations: 46.900 142.450 387.900
Nashville Intl, TN	ANG Operations: 322.900; ANG Maintenance: 138.100
Nellis AFB, NV	ACC Command Post: 320.000 381.300 (Raymond 22); ALCE AMC: 257.350 259.950; Safety of Flight: 305.600 (Bullseye SOF)
New Castle, DE	Wilmington Command Post: 343.000 (ANG Seabee); NG Operations: 46.900
New Century Aircenter, KS	Army Operations: 46.900 347.500
New Orleans NAS/JRB, LA	Base Operations: 379.150
New River MCAS, NC	Operations: 253.300
Niagara Falls Intl, MY	914AW Command Post: 340.025 (Carbonate); ANG Operations: 261.900 (Fuzzy)
Norfolk NS, VA	Base Operations: 126.375 268.800; AMC/ATOC:

130.650 349.500
North Central West Virginia, WV NG Operations: 139.050
North Island NAS, CA Base Operations: 355.500; NG Operations: 142.950 233.800 (Raid Ops)
Oceana NAS, VA Base Operations: 284.900; ATCOM: 6723.0 kHz USB
Offutt AFB, NE Command Post: 311.000 321.000 (Raymond 21)
Opa Locka Executive, FL CG Operations: 123.100 345.000 (Miami Air)
Orlando Intl, FL Army Operations: 41.500 148.800
Otis ANGB, MA 102FW Command Post: 262.000 (Raymond 36); ANG Base Operations: 372.200; CG Operations: 122.975 164.550 (FM) 345.000 (Cape Cod Air)
Patrick AFB, FL Command Post: 138.300 311.000 (Barrier); King Operations: 150.350 321.000; Rescue Operations: 138.475 255.500
Patuxent River NAS, FL Base Operations: 302.550
Pensacola NAS, FL Sherman Base Operations: 312.100
Phoeniz Sky Harbor Intl, AZ ANG Command Post: 140.000 311.000
Pittsburgh Intl, PA AFRC 911AW Command Post: 252.100 (Screamer); ANG Operations: 311.000 (Steel Control)
Point Mugu NAS, CA Base Operations: 267.500; ANG Operations: 305.600
Polk AAF, LA POE Operations: 36.050 374.200; Medevac Operations: 42.500
Pope AFB, NC Command Post: 134.100 257.100 381.300
Port Angeles CGAS, WA 127.700 345.000 (Port Angeles Air) 2182.0 2702.0 3120.0 5692.0 8980.0 kHz USB
Portland Intl, OR ANG Operations: 280.500 (Portland Guard Ops); ANG Command Post: 288.90 (Guard Command Post); 939ARW Command Post: 124.350 311.000 381.000
Portsmouth Intl at Pease, NH ARW ANG Operations: 141.950 321.000 (Pack Control)
Quantico MCAF, VA Base Operations: 355.300
Quonset State, RI NG Operations: 36.800 233.150 (Ladon Ops); ANG Operations: 383.300 (Rhody Ops)
Raleigh Durham Intl, NC NG Operations: 49.150 126.100 242.400
Rapid City Regional, SD NG Operations: 38.900 123.050 252.025
Ray S. Miller AAF, MN Operations: 49.650 255.400 (Miller Ops)
Redstone AAF, AL Base Operations: 126.200
Reno Stead, NV NG Operations: 32.350 118.050 122.800 277.500 (Rocky Ops)
Reno Tahoe Intl, NV ANG Command Post: 4341.0 8780.0 kHz USB (Caprock); ANG Operations: 388.850
Richmond Intl, VA NG Operations: 40.200 231.200 (National Guard Ops)
Rickenbacker Intl, OH Command Post: 238.800; NG Operations: 36.700 142.600 228.800; NG C-26 Operations: 139.300
Robins AFB, GA AFMC Command Post: 311.000 (Black Knight Control); 116 ANG Operations: 293.525 (Peachtree); ALC Maintenance Control Center: 225.925 (Eagle Control); AFRC Command Post: 372.175 (Gunrunner)
Rosecrans Memorial, MO ANG Command Post: 349.400
Rowan County, CO NG Operations: 42.000 126.100
Sabre AHP, TN Operations: 138.700
Sacramento Mather, CA NG Operations: 34.100 134.100 340.100 (Spartan Ops)
St. Paul Downtown Holman Field, MN NG Operations: 41.400 126.200 347.700
St. Petersburg Clearwater Intl, FL CG Operations: 345.000 (Clearwater Air)
Salina Muni, KS NG Operations: 48.950 304.600
Salt Lake City Intl, UT ANG Operations: 303.000 311.000 (Utah Control)
Salt Lake City Muni 2, UT NG Operations: 49.650 243.800
San Diego Intl, CA CG Operations: 157.150 2182.0 3123.0 5696.0 8984.0 kHz USB (San Diego Air)
San Francisco Intl, CA CG Operations: 345.000 (San Fran Air)
Santa Fe Muni, NM NG Operations: 41.000
Savannah Hilton Head Intl, GA 165AW Command Post: 225.750; CRTC Operations: 237.000
Schenectady County, NY ANG Operations: 140.450 251.250 291.900 (Skier)
Scott AFB MidAmerica, IL 375AW Command Post: 130.650 383.200; 126ARW Command Post: 138.550 277.700
Selfridge ANGB, MI Wing Command Post: 349.400 (Quarterback); CG Operations: 345.000 5696.0 kHz (USB (Detroit Air)
Seymour Johnson AFB, NC 916th Command Post: 311.000 321.000 (Lighthouse Control); 4FW Command Post: 311.000 321.000 (Raymond 25); ACC Safety of Flight: 376.100 (Lion SOF)
Shaw AFB, SC Command Post: 381.300 (Raymond 26)
Shelbyville Muni, IN NG Operations: 41.500 143.600 347.550
Sierra Vista Muni Libby AAF, AZ Operations: 122.950 (Libby Ops)
Simmons AAF, NC Base Operations: 142.350 245.500
Sioux Gateway
Colonel Bud Day Field, IA AMG Command Post: 141.825 373.100 (Bat Cave)
Smyrna, TN NG Operations: 41.500 149.800 373.900
Snohomish County, WA Army Operations: 34.100 119.350 244.400
Southwest Oregon Intl, OR CG Operations: 345.000 5692.0 8980.0 kHz USB
Spokane Intl, WA NG Operations: 38.750 123.050
Springfield Beckley Muni, OH 178FW Operations: 141.700 324.700 (Saber Ops)
Springfield Branson Intl, MO NG Operations: 41.900 134.950 241.800 (Bears Den)
Stanly County, NC 145AW ANG Operations: 376.125
Stewart Intl, NY 105AW Command Post: 379.400 (Polo); Army Operations: 49.750 126.200 321.700; Army Operations: 38.500 143.100 244.350 (Liberty)
Stockton Metro, CA NG Operations: 49.000 139.400 356.900 (Schnooer Ops)
Syracuse Hancock Intl, NY ANG Operations: 139.625 379.500 (Cobra Ops)
Tinker AFB, OK ACC Command Post: 139.950 141.650 287.450 305.600 355.200 (Raymond 24); 507ARW Command Post: 228.450 (Sooner Control/Okie Ops); ATOC: 119.150; AFMC Flight Test: 382.600 (Sabre Control)
Toledo Express, OH 180FW ANG Operations/Safety of Flight: 143.850 338.900 (Beehive)
Travis AFB, CA Command Post: 141.900 349.400
Trenton Mercer, NJ NG Operations: 121.950 242.400
Tucson Intl, AZ ANG Command Post: 138.525 392.200
Tulsa Intl, OK NG Operations: 46.900 139.450 267.300 (Lunar Ops); ANG Operations: 138.200 381.100
Tupelo Regional, MS NG Operations: 33.500 241.000
Tusi AHP, CA Operations: 41.050 126.200 229.500
Tyndall AFB, FL Command Post: 381.300 (Checker Ops) 361.400 (Have Quick timing)
Vandenberg AFB, CA Command Post: 311.000 321.000
Waterloo Regional, IA NG Operations: 36.700 142.600 231.550
Waynesville Regional Airport at Fourney Field, MO Operations: 237.500 (Fourney Ops); NG Operations: 38.050 138.500 225.125
West Bend Muni, WI NG Operations: 40.900 46.700 123.050 240.300
Western Range (30th Space Wing), CA Frontier Control: 121.400 256.000 266.000
Westover AFB Metropolitan, MA 439AW Command Post: 252.100 (Casino Royale)
Wheeler Sack AAF, NY Base Operations: 126.200 280.800
Whidbey Island NAS, WA Base Operations: 350.100
Whiteman AFB, MO Command Post: 311.000 321.000; NG Operations: 49.650 139.000 242.400 (Hawk Ops); 303FS Operations: 227.800 (Ground Hog)
Whiting Field NAS North/South, FL Base Operations: 233.700
Willow Grove NAS/JRB, PA AFRC Operations: 351.750 (Shortstop); Base Operations: 306.800; ANG Operations: 46.850 343.000; Army Operations: 34.550 143.025 226.500
Will Rogers World, OK ANG Operations/Command Post: 225.600 (Sooner Ops)
Winder Barrow, GA NG Operations: 44.000
W.K. Kellogg, MI ANG Operations: 140.400 267.800
Wright AAF MidCoast Regional, GA Base Operations: 38.700
Wright Patterson AFB, OH 445AW AFRC Command Post: 349.400 (Buckeye Control)
Yeager, WV ANG Command Post/Operations: 302.300 (CP Call-Blacksmith/Ops-Hammer Ops)
Youngstown Warren Regional, OH 910AW Command Post: 238.825 (Base Ops-Battlestar/910AW-Vader Ops)
Yuma MCAS/Yuma Intl, AZ Command Post: 337.900

❖ Command Post Updates

Another Tarheel, David Wentzel, passes along that the Air National Guard Command Post at Charlotte/Douglas Intl, NC, is 292.200 instead of 292.000 MHz as listed in September. Thanks, David, for the update.

The Researcher passes along that the National Guard at Bradley continues to use 41.900 and 242.400 MHz, instead of the officially listed frequencies we had in September. I would definitely keep an eye out for a possible change in the near future.

And that does it for this month. Hope you enjoy this list of interesting frequencies to monitor. Until next time, 73 and good hunting.

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Digital TV: Down to the Wire

I know, I know, you're getting tired of hearing about digital TV... But *MT* continues to receive reader mail about the subject. You're reading this about 60 days before the (almost) final switch to digital. As you probably know, almost all TV stations are already broadcasting a digital signal. In February, what happens is that these stations shut off their analog signals. In many cases, their digital signals will also be moving to new channels.

Indeed, *some TV stations have already made the move* – shutting off their analog signals early and flipping to digital. Reports filed with the FCC show 33 stations planning on closing their analog operations between September 1 and the end of 2008. One of the most common reasons given for the removal of the analog transmitter and antenna was to open up space for the digital equipment. In northern areas, tower work cannot be performed in winter, so if the work is to be complete by February 17, it must be done this fall.

All five NET Nebraska educational stations operating on "high-band" VHF channels 7-13 have already ceased analog operations and returned to the air as digital stations on the same channels. Stations switching to digital-only service include NBC affiliates in Great Bend, Kansas, and Hastings, Nebraska; ABC stations in Montgomery, Alabama, and Colby, Kansas; CBS stations in Sherman and Bryan, Texas; and the Fox station in New Orleans.

Many other stations will continue analog broadcasts but at reduced power. A common analog transmitter configuration involves two transmitters in parallel, each supplying half the station's total power. In many cases, these stations are removing one of the two analog transmitters early, cutting back to half power and replacing the removed analog transmitter with a digital unit. They can then, next February, simply switch off the analog transmitter, switch the antenna to the digital transmitter, and be on the air with a full power digital signal in a few seconds. To be perfectly honest, 99+% of viewers will never notice the power reductions.

Stations that are changing channels on February 17th probably want to be sure their transmitter will work on the new channel! Viewers here in the Nashville area have noticed the analog signal of our local CBS station, WTVF channel 5, disappearing occasionally in the middle of the night. Some of them have, on a hunch, rescanned the channels on their digital TVs – and found WTVF testing their digital transmitter on that channel. You should expect this in other markets – some of your analog stations may disappear temporarily in the middle of the night.

With considerable publicity, on September 8th, Wilmington, North Carolina, supposedly became the first TV market to shut off its analog signals and go all digital.

Well, maybe. For some reason, PBS station WUNJ-39 didn't participate. The station is part of a statewide network, but there's no technical reason they couldn't have shut down the analog transmitter in Wilmington only. I found it suspicious that WECT channel 6 was the only Wilmington station to file an FCC report indicating they would actually cease analog broadcasts before February 17th. It turns out the Wilmington analog signals (including WECT) have *not*, in fact, gone off the air. Rather, they're broadcasting a slide telling viewers why their shows have disappeared.

The FCC and local TV stations established a call center for Wilmington viewers during the September 8th transition. There were nearly 800 calls on the first day. Only nine were unaware of the switch to digital; another nine thought the stations they watched were exempt. Sixty-seven were aware of the conversion but failed to act – usually either because they forgot, or because they procrastinated too long and the analog signals went away before they got around to buying a converter box. Eighty-six didn't get their $40 coupons in time. (Only one found the store was out of boxes)

Sixty viewers couldn't figure out how to set up their converter box or digital TV. Another 100 said their box "didn't work." Thirty-three said their antenna "didn't work." Another 40 viewers thought they'd get the Wilmington stations over their Dish Network or Direct TV dish – but didn't have the optional local channel service. Fourteen thought all their TVs were on cable or satellite – and were proven wrong...

The largest group of callers, 232, involved viewers who couldn't get the aforementioned WECT channel 6 on their digital receivers. The Commission said many of these viewers were in areas outside the Wilmington market, like Fayetteville and Myrtle Beach, where the Wilmington digital signals don't reach. I suspect many of the Myrtle Beach viewers were unaware of new NBC station WMBF-32 in their town; WMBF has only been on the air for a few weeks. The FCC expects viewers closer to Raleigh will watch that city's NBC affiliate WNCN-17.

You've only got about sixty days to get digital converters for your antenna-fed TVs.

As the week after transition went on, the number of daily viewer calls declined. The number of viewers who were unaware of the move, or thought it didn't apply to them or their favorite stations, or hadn't bothered to upgrade, or couldn't figure out how to get their boxes working dropped to negligible levels. On the other hand, the number who had trouble receiving one or more stations remained fairly steady.

❖ New Publications

The 2008 edition of the NRC's *AM Radio Log* is out. The Canadian listings are rapidly shrinking, but there are at least sixty new U.S. stations under construction listed this year. The *Log* continues to be your best source of reference information for AM DXing.

Also new is Scott Fybush's *Tower Site Calendar 2009*. If you really want to prove you're a radio geek, this will do it! (I note my cubemate started looking at me funny after I put up my 2008 calendar in our workspace...)

❖ IBOC Notes

Finally, somebody is making some revenue from HD Radio! WorldBand Media LLC is working with Bonneville International Corporation, Emmis, and NextMedia to provide South Asian ethnic programming to listeners in Washington, Chicago, Los Angeles, New York, and San Jose.

At the September *NAB Radio Show*, the buzz seemed to be a new feature called "iTunes Tagging." As I understand it, this feature allows the HD Radio listener who hears a song they like to press a button, and the song is automatically ordered from iTunes. The "Program-Associated Data" feature of HD Radio makes this possible – the station can send a datastream that tells the listener the song and artist currently being played. (though this data can also be transmitted on analog stations, over the RDS data service...)

A post-show press release promotes a number of other data services, including traffic information, gas prices, weather, movie listings, news, and stock prices. CBS Radio is promoting new HD2/HD3 services NASCAR Radio and the Psychic Channel (?!), while "ESPN Radio HD" is also being pushed. In connection with ESPN Radio HD, a demonstration of Conditional Access was made. Conditional Access allows stations to limit reception of subchannels to listeners who've paid for the content.

Glenn Hauser relayed news of IBOC broadcasts in Brazil. Radio station Globo SP on 1100kHz

in Sao Paulo was reported with the data sidebands in early August. Their station on 1220 in Rio de Janeiro is also reported to have installed IBOC, as well as one on 1150 in Belo Horizonte. I don't suppose anyone will be hearing these in the States!

❖ KFI-640 back to Normal

At the end of 2004, KFI-640's tower near Los Angeles was hit by a small plane and destroyed. The station has been operating for nearly four years on a temporary antenna, at reduced power, while waiting for reconstruction of the wrecked tower. There was some difficulty in getting local permission to rebuild; then, when the new tower was nearly complete, a guy-wire failure caused it, too, to collapse.

In September, the new tower was finally completed. The station ran a special program celebrating the restoration of their normal signal...

❖ New Canadian Expanded-band Station

I guess, if you want a radio station at your college and there aren't any FM frequencies available, you might as well go for AM. That's what Concordia University in Montreal did. They began testing their new station CJLO-1690 in mid-September, expecting to cover Montreal Island and the nearby suburbs.

They were very happily surprised – first, with daytime reports from Ottawa and Quebec City. Then, the sun went down – and the DXers started in. As of deadline for this column, CJLO has received reports from four European countries. See the URLs below for a link to a recording, made in Scotland. It's a bit noisy, and you'll have to understand French, but it's pretty amazing to hear a 1,000-watt station as it sounds on the other side of the Atlantic!

I'm not entirely sure why the test announcement was made in French, as the CJLO schedule shows only one hour of French-language programming! CJLO's programming is typical of a college station: a variety of underground rock music, with a few world-music programs.

❖ How many stations are there?

In September, the FCC released broadcast station counts for March 31 and June 30. Over the 90-day period, a trend was reversed, with two new AM stations coming on the air for a total of 4,778. One hundred nineteen new FM stations signed on for a total of 9,346. There are 1,758 full-power TV stations and 2,822 low-power and translator operations – a decline of 105. A fair number of TV translators in the West are allowing their licenses to expire, without bothering to find new channels below 52 or converting to digital operation. Twelve new LPFM stations came on the air, for a total of 851.

❖ 'Till Next Month

Just when you thought you'd heard every station you could possibly hear, someone builds a new station or moves an existing station to a new frequency. What's the newest station you've logged? Write me at 7540 Highway 64 West, Brasstown NC 28902-0098, or by email to *dougsmith@monitoringtimes.com*. Good DX!

URLS IN THIS MONTH'S COLUMN

My AM DX blog
http://americanbandscan.blogspot.com.
CJLO-1690 Montreal, recorded in Scotland
http://cq.cjlo.com/1690cjlo.mp3
WorldBand Media - A company planning ethnic programming on HD2 and HD3 subchannels
www.worldbandmedia.com/
NET Nebraska educational TV: click on "Current NET Transmitter Transition Schedule"
www.netnebraska.org/extras/dtv/
FCC report on first day of DTV transition in Wilmington, North Carolina
http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-285330A1.txt
Scott Fybush's Tower Site Calendar
www.fybush.com/calendar.html

National Radio Club's AM Radio Log
www.nrcdxas.org/catalog/books/index1.html

AM BANDSCAN STATION REPORT

NEW:

New stations on the air

Juneau, Alaska 10,000/3,000 ND liberal talk)	1330	KXLJ (Air America
Eureka, California 790/790 ND gious)	1400	KIHH (Catholic reli-
Sweetwater, Florida 4,000/5,000 DA-2 talk)	880	WZAB (conservative

New station permits granted

Palm Springs, Florida 5,000/250 DA-2	1500	
Middleton, Idaho 1,000/1,000 ND	1400	(near Boise)
Marquette, Michigan 50,000/2,000 DA-N	1430	
Jackson, Mississippi 5,000/300 DA-2	1440	
Peralta, New Mexico 430/220 DA-2	700	
Middletown, New York 1,000/1,000 DA-D signed calls WZCC)	1400	(already as-

New station applications denied/dismissed

Taft, Florida (mutually exclusive with Palm Springs)	1500	

New-station permits cancelled

Albert Lea, Minnesota	1100	

Stations deleted

Harvard, Illinois WMCW	1600	

CHANGES:

Stations requesting moves to new frequencies

Athabasca, Alberta from 850 AM	94.1	CKBA
Dartmouth, Nova Scotia from 780 AM	92.9	CFDR
Guelph, Ontario from 1460 AM	95.7	CJOY
Sudbury, Ontario from 790 AM	93.5	CIGM

Callsign changes

Denver, Colorado from KKFN	950	KRWZ
Sweetwater, Florida (new station)	880	WZAB
Clayton, Georgia (new station)	1400	WNGA
Hilo, Hawaii from KIPA	620	KHNU
Waterloo, Iowa from KWOF	850	KXGM
Iola, Kansas from KALN	1370	KIOL
Monticello, Maine from WCXH	710	WXME
Boston, Massachusetts from WTTT	1150	WWDJ
Ada, Michigan from WDSS	1680	WPRR
Sauk Rapids, Minnesota from WXYG	540	WMIN
Jackson, Mississippi from WKXI	1400	WJQS
Laurel, Mississippi from WEEZ	890	WHJA
Las Vegas, Nevada from KBTB	670	KMZQ
Berlin, New Hampshire from WRTN	1490	WKDR
Hackensack, New Jersey from WWDJ WTTT)	970	WNYM (was briefly
Albuquerque, New Mexico from KKJY	1550	KQNM
Milan, New Mexico from KQNM	1100	KKJY
Middletown, New York (new station)	1400	WZCC
Rochester, New York from WRCI	990	WDCX
Bend, Oregon (new station)	1340	KBNW
Harrisburg, Pennsylvania from WTCY	1400	WHGB
McKeesport, Pennsylvania from WPTT	1360	WMNY
Rockwood, Tennessee from WOFE	580	WYHM
Burleson, Texas from KHFX	1460	KCLE
Cleburne, Texas from KCLE	1140	KHFX
Cedar City, Utah from KNNZ	940	KOBY
Huntington, West Virginia from WEMM	1470	WRWB
Hudson, Wisconsin from WDGY	630	WREY
Hudson, Wisconsin from WMIN	740	WDGY

ND: non-directional
DA-N: directional at night only
DA-D: directional during daytime only
DA-2: directional all hours, two different patterns
DA-3: directional day, night and critical hours, three different patterns

Ernest Robl
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Journalists Portray Railfans in Bad Light

One side effect of the tragic collision between a commuter train and a freight train at Chatsworth, Calif., on Sept. 12, has been that the mainstream media have discovered railfans. And, unfortunately, most of the stories that followed that accident did not portray railfans in a particularly good light.

You probably already know the basic story. A Metrolink commuter train, that was to have waited at a switch and red signal, passed that signal and collided head-on with a Union Pacific freight train, resulting in more than two dozen fatalities and many more injuries.

Federal investigators have concluded that the engineer of the Metrolink train was apparently exchanging text messages on his cell phone – a violation of work rules – with railfans who had befriended him, and that that apparently distracted him from obeying the signal.

I deliberately say "apparently" because the final report on this accident may be months away and is likely to cite a complex combination of factors that contributed to the accident.

Investigations of major transportation accidents fall into three stages: determining what happened; determining why it happened; and trying to find ways to avoid this from happening again.

Even the first step is not as simple as it sounds. Yes, the trains collided. But, as part of the study of what happened, the investigators try to compile a second-by-second timeline of what happened in the minutes before the crash, and what those involved – the engineers, conductors, dispatchers – were doing at those precise moments.

Though photographed on a European rail line (in Austria), this photo illustrates how automatic train stop (ATS) at a red signal would be too late in most cases. The photo was made from the engine of an international passenger train bound between Innsbruck and the Swiss border. The white box immediately adjoining the right rail that this train is on, approximately even with the lineside signal, is the transmitter for the automatic train stop. If a train approached this signal at full speed, it would slide through the switch into the path of the oncoming train. But, the engineer of this train had to acknowledge previous signals telling him to slow down and expect to stop.

Even a world-class railroad museum, such as the California State Railroad Museum (CSRM), is seldom a hotbed of railroad radio traffic, but special events and festivals can dramatically increase activity.

In discussing this accident, I frequently use the word apparently, because, though initial indications were that the commuter train ran a red signal, the initial indications are not always correct – and the most obvious initial judgment is not always supported by a careful examination of the facts.

There was a rail accident in England a number of years ago, where a train was supposed to have received a red stop indication, but instead proceeded on a false green signal. In that particular accident, a detailed investigation revealed that a signal maintainer had mistakenly connected two wires incorrectly, resulting in the false green indication.

Complex Issues

As briefly indicated above, the issues surrounding railroad operations, dispatching, and signaling are complex. And, many of the reporters managed to get some of them wrong. (Most professional reporters do try very hard to get facts in their stories right, but when someone with no background in railroading gets thrown into such a technically complex story, he or she is facing a major challenge.)

So, when some young railfans came forward to report that they had been texting the commuter train engineer, some reporters began focusing follow-up stories on railfans. One story distributed by the Associated Press (AP) described fans as people who stood close to speeding trains and who climbed on signal masts to get better photo vantage points – both obvious safety violations.

During preparations for a railroad festival at the CSRM in 1992, two generations of Santa Fe locomotives briefly came coupler to coupler, while equipment was switched for outdoor display. The locomotive at left, then new, was provided by the Santa Fe (since merged into BNSF), while the locomotive at right is part of the CSRM's permanent collection.

While I don't doubt that these things have happened, I have never seen them in my many years around railroads. Yes, I've seen some extreme and somewhat unsafe behavior by fans. But these have been very, very rare exceptions.

Most of the fans I know are content to watch trains from a safe distance and to listen to railroad radio communications on their scanners. For every fan you see standing at trackside waving to a passing train (and at a safe distance, at that), there are probably dozens more sitting in their cars, listening to scanners – people that you never really see.

Where am I going with this? Well, if the subject of railfans comes up in conversations, I try to point out that most of these are people with a genuine interest in watching and understanding railroad operations – and that, unfortunately, most hobbies have their extreme and even lunatic

This former Southern Pacific E7 passenger locomotive, in the railroad's "Daylight" paint scheme, is normally stored inside at the CSRM, but is brought outside for some special events. (Southern Pacific has been merged into Union Pacific.)

fringe. I hope you will do the same in talking to your acquaintances.

Many of the fans that I know are also members of railroad advocacy groups and try to help railroads by reporting hazardous situations.

❖ The Signal Issue

Oh, and before I leave this diversion from focusing on radio issues, I need to point out one more problem in much of the coverage. A variety of "experts" have been quoted as saying that some form of automatic train stop (ATS) or positive train control (PTC) would have stopped the commuter train after running a red signal.

While I am very much in favor of having an additional level of safety, such as automatic train stop (such systems are not new and have been the norm in Europe for many years), the point of ATS is not to stop the train when it passes a red signal. At that point it is already too late.

Trains have long stopping distances, and the final red signal is often just before a switch. Even if a forced or "penalty" brake application takes place at a red signal, the train would likely still slide through the following switch and into the path of an opposing train.

The point of ATS is to stop a train *before* it reaches a red signal. ATS requires an engineer to acknowledge any restrictive signal. These are the signals before the final red signal that tell the engineer to slow down and expect a red signal ahead.

If the engineer does not acknowledge a restrictive signal, a penalty brake application takes place at that point, stopping the train at that location.

Yes, as a final measure, a red signal would also initiate a penalty application, which would be useful in some situations, such as one train following another, and which would still mitigate the severity of a potential collision.

I know one thing: We will now all pay more attention when we hear engineers calling signals on our scanners, whether we are at trackside or traveling on a train.

❖ Positive Train Control

Positive Train Control (PTC) is a much more sophisticated system than ATS. While it has been talked about for many years, it is still in its developmental stage.

What PTC does or would do is constantly monitor the operation and location of trains and take action when it appeared that the train was either going to go past its assigned limits or exceed the permissible speed at a given location as modified by the current operating conditions.

For PTC to work, you need an almost constant exchange of data between a dispatching system computer and a computer aboard the lead locomotive of a train. You also need a lot of bandwidth for all this data to be exchanged.

"Braking" News

Two developments took place just as I was closing out this column:

The White House announced that President Bush would sign a railroad safety bill that mandates PTC for most major main lines by 2015. The bill particularly mentions lines on which both passenger and freight trains operate together and lines on which hazardous materials are transported.

At the North Carolina Transportation Museum at Spencer, N.C., a former Southern Railway locomotive switches a train consisting entirely of cabooses from various railroads.

Three major railroads – Union Pacific, BNSF, and Norfolk Southern – announced an agreement to work together on interoperable PTC standards. Each of the railroads has done some testing with its version of PTC. The agreement by the three railroads ensures that there will a national standard, sooner rather than later, and that research by the three railroads is going in the same direction.

PTC will be very expensive for the railroads. For each railroad, this means equipping nearly every locomotive (and even some work equipment that operates on rails); adding a lot of communications infrastructure; and of course doing a substantial amount of programming for the computers used in the system.

One problem that has not been addressed is how the PTC mandate would affect shortlines that transport hazardous materials. Many shortlines are unlikely to be able to afford implementing such a system without some type of government grants.

❖ Railroad Museums

While railroad museums are not railroads in the strict sense, most have sufficient trackage to allow equipment to be moved around from time to time. Some have enough tracks to provide visitors with at least short train rides. And, most of these museums are connected to the national rail network, allowing equipment to be brought in or out – or to allow railroads to bring in contemporary equipment for special displays.

Railroad museums also sometimes serve as the origination point for special charter or excursion trains.

Making such moves requires all the same safety considerations as during switching on regular railroads. There are even additional safety considerations as railroad museums have visitors wandering around the grounds. So, radio plays an important part in such switching.

Therefore most museums apply to the Association of American Railroads (AAR), the industry frequency-coordinating group, for allocation of one or more AAR frequencies.

This makes sense, as operable motive power acquired by the museums typically already comes equipped with AAR approved radios. Volunteers are often railroad employees with company-supplied portables. And when special equipment is brought in for temporary display, it, too, has radios capable of operating on any AAR channels.

As many museums are located outside the most congested areas – both in terms of rail traffic and railroad radio traffic, finding one or more available AAR channels usually is no problem.

Here are examples of frequencies used by major museums:

California State Railroad Museum (CSRM) in Sacramento: 160.335 (AAR 15/15) for administration and general operations; 160.440 (AAR 22/22) for its tourist train.

North Carolina Transportation Museum, Spencer, N.C. (site of a former major Southern Railway yard): 160.695 (AAR 39/39).

Don't expect railroad museums to be hotbeds of radio traffic much of the time. But, most of these museums have several special events per year during which additional equipment is put on display or moved from indoor storage to an outdoor area. If you visit the museum during or just prior to such an event, bring your scanner, and you may find out about what equipment is being moved.

Former Southern Railway passenger locomotive 6133 heads a special train at the North Carolina Transportation Museum during a special weekend festival celebrating the heritage of Norfolk Southern in 2006. (Southern Railway merged with Norfolk & Western to form Norfolk Southern.)

Oh, and the **Golden Spike National Historic Site** (GSNHS) at Promontory Utah, which can be considered a museum of sorts, uses a National Park Service federal frequency, 171.675. On the other hand, this remote site north of Salt Lake City, where Union Pacific met Central Pacific to complete the First Transcontinental Railroad, is no longer on the national railroad network. Two replica locomotives operate on a short isolated section of track; the transcontinental main line was moved to a new alignment many years ago.

❖ Narrowbanding

The AAR Safety & Operations Management Committee has set July 1, 2010, as the implementation target for the federally mandated narrowbanding project. Narrowbanding assigns intermediate frequencies between the existing AAR frequencies, thereby doubling the number of frequencies available to railroads in the more congested urban areas.

Most modern railroad radios already have sufficient discrimination to be able to broadcast and receive on these narrower channels. For some equipment it is simply a matter of programming the new frequencies or making minor hardware modifications.

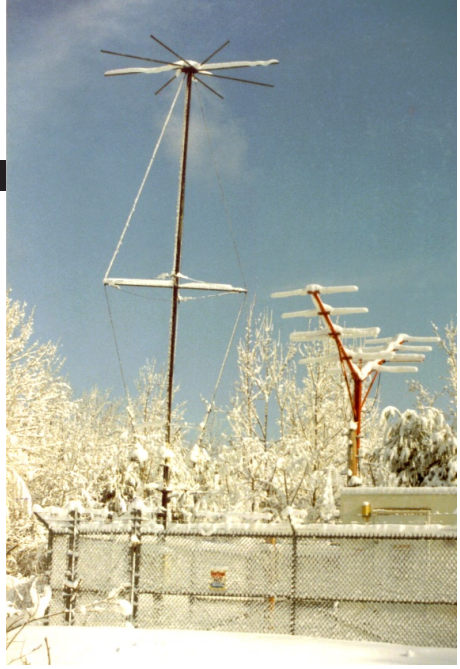
After mid 2010, locomotives used in interchange or run-through service (operating over several railroads) must be equipped with radios capable of working on the narrower channels.

BELOW 500 kHz

DXING THE BASEMENT BAND

Kevin Carey, WB2QMY
kevincarey@monitoringtimes.com

Winter DX



AS/359 kHz near Amherst, NH

Without fail, winter seems to bring a heightened interest in Longwave DXing. It may be because there's less static on the band, or that the long nights promote DX from greater distances, or that there's not as much outdoor work to do. Whatever the reason, it comes as a welcome change, and it certainly beats shoveling snow from your driveway!

❖ Euro-Broadcasters

The interest in this topic never ceases, no matter what the season. It certainly is possible to hear these stations in North America, but you shouldn't expect "armchair" copy. The key is to listen at times when there is a complete path of darkness between you and the transmitting station. On the East Coast this means trying for signals between dusk and about 1 a.m. local time.

Below are some stations you may want to try for. There are others, but these are the ones most frequently reported to the column. Note the high Effective Radiated Power (ERP) used by these stations.

Freq.	Location	Power Output
153	Algeria	250 kW
162	France	2000 kW
171	Russia	6400 kW
183	Germany	2000 kW
189	Iceland	300 kW
198	England	600 kW
234	Luxembourg	2000 kW
252	Ireland	500 kW

❖ Aviation Beacons

Chasing non-directional beacons (NDBs) is hugely popular during the winter months. Low and medium-powered beacons are sprinkled throughout North America and occupy the band from 190 to 535 kHz. These stations do not have very interesting programming – just a slow, repetitive CW ID. However, it is not the content of the transmission we are interested in, but the *fact* of reception.

Most beacons operate with less than 50 watts of power (25 watts in many cases) from small, unmanned shacks. They use a rather small antenna, and are not meant to be heard at distances over 100 miles or so. Imagine the thrill of pulling one in at five or ten times that range.

Nighttime is the best time to listen for beacon DX. Often you'll hear several stations on a single frequency, and will need to sort through them to pick out the IDs. To do this, it helps to know a thing or two about ID formats. For instance, Canadian IDs can usually be identified by two primary traits. First, they typically use a 400 Hz modulated tone (as opposed to 1020 Hz commonly used in the U.S.) Also, they will have a long dash after the ID. U.S. beacons do not have a dash after the ID. With these traits alone, you should be able to quickly determine a beacon's country of origin.

When hunting beacons, don't neglect the band during the daytime. Although you won't hear stations from as far away, you're likely to hear some beacons that are covered up by DX at night. In fact, some DXers enjoy the challenge of daytime monitoring. An intercept of 400 miles or more during the day would be a prized catch indeed.

❖ Lowfers

Moving down the band, there's a sliver of spectrum from 160 to 190 kHz that is home to a hardy group of experimenters known as Lowfers. Lowfers have been using the band for meaningful communication since at least the early 1970s.

Limited by regulation to 1-watt and a 50 foot/15 meter antenna, these stations try to "push the envelope" of low power communication. Take a slow spin through the band and you might be rewarded with a Lowfer intercept. For a list of active stations, check the listings available at **www.lwca.org**. QRSS (super-slow CW) is a predominant mode these days, and you'll need a piece of free software to decode it. Perhaps the most popular program for QRSS is Argo, available for download at: **www.weaksignals.com**.

A bit further down the band at 136 kHz, you may find more experimental activity. Many countries allow amateur access to this frequency with much higher power limits than those imposed on the traditional "Lowfer" band.

Jumping up the band for a moment, there's another group of U.S. experimenters operating just above 500 kHz under a special FCC license (callsign WD2XSH). For more information on their activities, visit **www.500kc.com**. You can even submit a reception report at this web site. Experimenters in other countries are also using frequencies in the vicinity of 500 kHz – be sure to check this part of the spectrum when you're looking for activity.

❖ Even Lower

Below 136 kHz, the main signals you'll hear are military RTTY stations sending encrypted data. These powerhouses are at various locations in the U.S. and can frequently be heard around the clock. At 60 kHz, you should be able to hear the pulsating carrier of WWVB in Fort Collins, CO. (This signal is sometimes confused with slow Morse Code.)

WWVB is the sister station of WWV operating on shortwave. Longwave time stations have the advantage of providing a more stable, ground-hugging signal that is desirable for automated time keeping and laboratory applications. Today, it's even possible to buy an inexpensive table clock that locks onto WWVB and provides extremely accurate time that never needs to be reset. Look for more applications of WWVB in the future, including affordable wrist watches and appliances with built-in radio-controlled clocks.

At 17.2 kHz, you may be lucky enough to hear the last-working example of an Alexanderson Alternator. This electro-mechanical transmitter (no tubes or transistors) takes to the air from a museum in Grimeton, Sweden. It is fired up for special occasions. You can view the operating schedule and learn more about this historic transmitter at **www.alexander.n.se**. Listeners in Europe and the East Coast of North America would have the best shot at hearing this rare station.

❖ Mailbag

Lane Denune, KD8IIC (OH) has been hearing a station IDing as **VEETIE** on 278 kHz. He notes that it has a long dash after the ID, much like a Canadian beacon would have. He copies the signal strongly in the Columbus area using an Icom R75 receiver and a random length antenna.

Lane, I believe what you're hearing is a negative-keyed version of a nearby beacon. This is a transmitter defect that shows up from time to time, resulting in a tone where there should be silence, and silence where there should be a tone. (Note that this is *not* a simple inversion of dots and dashes.)

By plotting VEETIE on graph paper and filling in the inverse blank spaces below, I was able to determine that you are most likely hearing beacon **HOC**, in Hillsboro, OH (278 kHz). This decoding technique is discussed in detail in my book *Listening to Longwave*, available through Universal Radio (**www.universal-radio.com/**).

Speaking of longwave resources, I am pleased to announce that my audio recording *VLF Radio – Sounds of Longwave* is also available through Universal Radio. Check their website for details.

That's it for December. I wish all readers a Merry Christmas, and joyous holiday season. I hope that you'll be able to log some special times with friends and family. See you next month!

George Zeller
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Pirate Cat Radio in San Fran and LA

It is very unusual for a North American pirate station to operate openly with widespread publicity. But, we have a current example of that situation right now. Veteran DXer Harry Helms spotted their web site, which you can see for yourself at **www.piratecatradio.com/** They produce podcasts over the internet which are relayed on their FM transmitter in San Francisco.

Although many scores of FM pirates come and go on the United States FM broadcasting band, **Pirate Cat Radio** has a unique philosophy. According to the station, "**Title 47 Section 73.3542 of the U.S. Code of Federal Regulations** currently allows Pirate Cat Radio 87.9fm to legally broadcast without a formal license from the FCC." This highly unusual quote is posted on the main web site of the station.

This section of the Federal Regulations reads in part as follows:

(a) Authority is granted, on a temporary basis, in extraordinary circumstances requiring emergency operation to serve the public interest. Such situations include: emergencies involving danger to life and property; a national emergency proclaimed by the President or the Congress of the USA and; the continuance of any war in which the United States is engaged, and where such action is necessary for the national defense or security or otherwise in furtherance of the war effort.

(1) An informal application may be used. The FCC may grant such construction permits, station licenses, modifications or renewals thereof, without the filing of a formal application.

(2) No authorization so granted shall continue to be effective beyond the period of the emergency or war requiring it.

According to **Black Cat Radio**, this provision of the Federal Regulations permits them to operate for the duration of President George W. Bush's "War on Terrorism." This novel approach has not yet been tested by enforcement authorities or the courts by press time of *MT*. Obviously, this article does not constitute legal advice for anybody who may plan similar tactics.

The station announces that they have transmitter coverage of both San Francisco and Los Angeles. Have any of our West Coast readers been hearing the station? If you're not hearing it on FM, you can check out their 24 hour podcast via their web site.

The station address for reception reports is Pirate Cat Radio, 2781 21st Street, San Francisco, California 94110. They also have an e-mail address of *monkey@piratecatradio.com* and they invite listener calls via their "studio line" telephone number of 415-341-1199. Programming consists of well produced rock and jazz music and commentary by a studio DJ.

❖ Antenna Pirates

The Somerset PA *Daily American* reported in mid-September that thieves had stolen a 120 foot radio tower in Paint Township. The tower and a variety of copper wire were stolen. Local law enforcement personnel speculated that the thieves tore down and stole the tower by using acetylene torches. While there is no basis for speculating that radio pirates stole this antenna, it is one more indication that the struggling USA economy and unscrupulous individuals are combining to create additional danger to radio hobbyists.

❖ Holiday Pirate DXing

Every year the heaviest volume of North American shortwave pirate broadcasting has traditionally appeared around the winter holidays. Thanksgiving, Christmas, and the New Year holiday experience the most concentrated period of pirate broadcasting that we see at any time during the year. When Santa brings you a new receiver, he certainly will realize that this will be a good time of year to use it.

❖ Pirate Web Sites

Veteran DXer Jerry Berg has spotted two more, little known, pirate radio web sites. "Pirate Radio USA" is found at **www.pirateradiousa.com/** It is associated with a documentary film about FM pirate broadcasting in the United States, so the web site is worth a look. Another little known site, entitled "Shortwave DX," is found at **www.freewebs.com/ukdxer/index.htm**

❖ What We Are Hearing

Monitoring Times readers heard two dozen different pirate radio stations this month. You can hear them, too, using some simple techniques. Pirate radio stations never use regularly announced schedules, but shortwave pirate broadcasting increases noticeably on weekends and major holidays. Tune your dial up and down around the 40-meter (7000 to 7300 kHz) ham radio band to find the stations, but more than 95% of all North American shortwave pirate broadcasts are heard on **6925 kHz**, plus or minus 30 or 40 kHz.

Amos and Andy Radio- Somebody has been relaying tapes of old time radio broadcasts. This is not uncommon on the pirate bands. (Unknown)

Captain Morgan- TV audio from the old Outer Limits show is added to the rock music format. (None, send loggings to Free Radio Network web site)

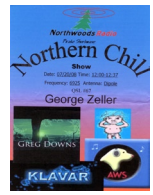
Channel Z Radio- They normally program rock music with a slogan of "The Last Channel that You'll Ever Need," but they also actively relay various other pirate stations. (Blue Ridge Summit)

Conelrad Radio- This one memorializes the old civil defense radio system in the United States, complete with air raid sirens. (none)

Dead Cat Radio- They feature rock music mixed with animal sound effects. (Unknown)

Liquid Radio- They have expanded their playlist beyond rock music. Various world music styles have been heard during recent broadcasts. Some shows come from a Corsair transmitter. (*wwrbfm@gmail.com*)

MAC Radio- Paul Starr's oldies rock pirate operates on odd frequencies such as 3275, 6850, and rarely even 6925 kHz. (*macshortwave@yahoo.com*)



Northwoods Radio- With a slogan of "Broadcasting from the Great Lakes," their rock music is preceded by their loon call interval signal. We see their QSL here this month. (*northwoodsradio@yahoo.com*)

Pirate Radio Boston- Charlie Loudenboomer, the maven at this east coast pirate, has been verifying lately. (*pirateradioboston@yahoo.com*)

Radio Jamba International- Rock music and comedy have been supplemented on recent shows with discussions of the Corsair pirate AM transmitter. (Belfast)

Sundown Relay- A pirate has been relaying programming from an unidentified podcast that IDs as "Sundown." Little is known about the pirate or the podcast operation. (*sundownnc@wise.com*)

Sycko Radio- Rock music and comedy have always dominated their programming. (*syckoradio@yahoo.com*)

Toynbee Radio- Here's a station that specializes in confusing subliminal messages. (Unknown)

Undercover Radio- Dr. Benway combines rock, pirate discussions, and fables about his travels. (Merlin and *undercoverradio@gmail.com*)

Voice of Influenza- This veteran pirate has returned. They program rock music and discuss remedies for the announcer's illness. This may have been a relay of an old tape, given the cheaper stamps announced during the show. (Belfast)

WBNY- Although Commander Bunny of the Rodent Revolution and Kracker did not win the USA Presidential election, his shows survive on the pirate bands. (Belfast and *rodentrevolutionhq@yahoo.com*)

WFUQ- This one features comedy and obscene identification slogans. (Unknown)

Wind Up Radio- At the end of their "mellow music" shows, they say that they are "all wound down." (Unknown)

WMPR- They are still active with their techno rock "dance party" format. (Known to QSL only at the Winter SWL Festival)

WPON- This new one uses a slogan of "The Weapon." They mix rock music with critical commentary on President Bush's war policies. (None)

Wolverine Radio- Following a rock music riff interval signal, more rock follows during their shows. They have been known to transmit SSTV digital images. (None announced)

WFUQ- It doesn't take much imagination to figure out what the call letters stand for on Jack Hammer's rock music pirate. (Unknown)

WMPR- "Micro Power Radio's" dance party techno rock programming is easy to spot. (None; has verified only at the Kulpsville Winter SWL Festival)

WTCR- "Twentieth Century Radio" features mainly oldies rock and classic rock music, but some of their

Continued on page 71

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SIMPLE GIFTS

At the time I am writing this month's column, we are riding an enormous nationwide financial roller coaster. Also, by the time you read this we will have elected a new President of the United States. There is an old curse that goes: "May you live in interesting times."

Normally I devote the December column to making suggestions about neat new radio toys that would make good choices as holiday gifts. However, the above mentioned situations, coupled with other factors influencing "The Real World," give me pause when it comes to inviting folks to put out cash to further their ham radio pursuits. I am also mindful that more than a few folks who enjoy reading *MT* can be placed in the *fixed income* or at least *limited budget* categories.

With that in mind, I want to return us to a simpler time. I have always maintained that ham radio need not be an expensive hobby. So this month I will still make gift suggestions to you: The difference is that you won't find any of these suggestions in the commercial environment. These are things you can make or do – for yourself or for your ham friends. Most of these ideas can be had for little or no expense. As you will see, it really is the thought that counts.

❖ Show Your Gear Some Love

When was the last time you popped the lid on your rig and gave things a look? I am one of those folks who are always tearing into things and making changes, so the general neglect factor in my shack is relatively low. But if you spend most of your time operating and not modifying, it wouldn't hurt to deenergize your equipment and clean out the dust and grime that can form inside.

Many modern rigs use cooling fans to keep things operating as they should. As these fans pull air across the vacuum tubes, heat sinks, or other generally hot parts, they also pull in a lot of airborne particulate matter that can form a nasty patina on critical surfaces.

Once you have things cleaned up, you may see other matters that need attending. This is also a good thing. Preventative maintenance matters may even be listed in your owner's manual. But common sense can be applied in most cases. Some contact cleaner can clear up a scratchy potentiometer. Cracked or frayed wiring can be replaced. Get the idea?

If you have the skill and equipment (or know a friend who does), why not give your transceiver a full bench alignment? A little tweaking and peaking will have your radio operating at full song. You will have a cleaner and more powerful signal – always welcome on the bands.

Don't forget to give your accessories a bit of friendly attention as well.

❖ Share the Best of 2009

I can't actually take credit for this idea. Every year, one of my Significant Other's relatives sends us a family calendar. It is nothing fancy. She works it up using a standard template that can be found for Microsoft Word or Sun Open Office. She fills out each month with family birthdays, anniversaries and memorials. She also includes upcoming events for the year, such as the date and location of the family reunion. She adds a few pictures and it is a nice gift that keeps on giving throughout the year.

Why not do something similar for all your ham friends? Build a calendar that includes club meetings, regional Hamfests, contests, RACES/ARES events, and significant dates in ham radio history. (Guglielmo Marconi's birthday is April 25, 1874, and Hiram Percy Maxim's birthday is September 2, 1869, just to get you started.) A quick trip around the Internet should yield lots of possibilities.

If your club keeps records of members' birthdates, you may think about adding them. While you are poking around the club records, see if you can find any events from the club's history that might be worth noting. You can use pictures of great ham gear or maybe some candid shots from last year's Field Day. Add an appendix page or two with important operating frequencies and phone numbers.

You can print all this out yourself or use a local printer or office supply house to bind it on heavy duty paper.

❖ Hams on the Web

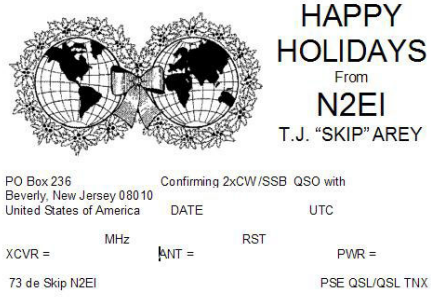
I often find neat amateur radio links when pulling together information for this column. I also get dozens of links sent to me by you folks reading *MT*. I make a point of keeping these items relatively sorted out. Another nice simple gift to your radio hobby friends might be a list of your Top 100 Favorite Ham Web Links. You can break things up along the lines of General Operating, Construction, Contesting, DX Chasing, etc. You may try pulling together specialized lists such as Classic Equipment or QRP Operating.

Before you finalize your list, you will want to give each link a quick check. Web URLs have a shelf life. Some sites only rise to use for a brief period of time. You don't want to share a long list of "Error 404" messages with folks. If you are affiliated with a Web site or have one of your own, make sure your friends know about it by adding it to your list.

❖ Make a Seasonal QSL Card

If you hear me on the air through the months of November and December, it is safe bet that you will receive one of my Holiday QSL Cards. I started this practice about 10 years ago, and I always enjoy coming up with ideas for the design.

Home brewing QSL cards has never been easier. The advent of the personal computer allows you to whip up cards for any occasion. You can use a program such as John McDonough WB8RCR's QSL Maker **www.qsl.net/wb8rcr/hamradio.html** or you can whip up your own in most any word processing program. Pick up a pack of festive colored paper at your local stationary or office supply store, and you can share the holiday spirit with all your contacts.



Homemade Holiday QSL Cards are a great Simple Gift.

If you don't see yourself as being all that artistic, shop around for holiday postcards. All it takes to turn a festive scene into a ham radio QSL card is your Callsign and some pertinent QSO information.

By the way, this isn't just a great holiday gift giving idea. I use postcards in this way when I am on vacation. Grab a fist full of cards with local color and information and add your ham radio information to make a truly unique and memorable QSL card.

❖ Give the Gift of Parts

I am well known for a couple of things. I like to build electronics projects, and I like to recover and recycle parts from cast off electronics to build those projects. I have even turned this parts scrounging idiosyncrasy into an ongoing series of articles that appear from time to time in *Make Magazine* **www.makezine.com**.

Since I enjoy building and I usually have a lot of parts in my junk box, I sometimes like to gift

my close friends with the goodies to put together a simple radio hobby project. They get a present, and I usually win a convert to the solder melting set.

Dozens of schematics for simple projects can be found in books at the library or on the Internet. Perhaps you can find enough parts to put together a small kit for a code practice oscillator (CPO). A CPO can be made from a transistor or two, or even the ever present NE555 Timer chip. Another possibility would be a simple audio amplifier using a basic IC such as the LM386.

Pull together the parts, photocopy the schematic, and put the collected components into an Altoids ™ mint tin that can serve as a project case.

❖ Work a Contest and Submit a Log

Yes, this is a gift of sorts. While it is hard for even the most dedicated single op amateur to put up a score that will grace the pages of most ham radio magazines, you can still "Stomp on the Terra" as Lord Buckley used to say. The first part of this gift is given to yourself. You get the pleasure of operating in the contest, making contacts, running into a few friends old and new. Jumping on board most contests is as simple as finding a copy of the rules and throwing out your Callsign on the bands. Even if you are not a big contest type of person, getting out there and giving out a few points to those who are is a gift of sorts.

The second (or is it third?) part of the gift is when you submit your log. Even a rather meager log provides the contest officials with information that helps them verify the scores and contest conditions. You are performing a service to your fellow hams by submitting your log. If you only have a couple of dozen contacts, most contest officials still accept paper logs.

❖ A Good Old Fashioned Rag Chew

Operating is a gift! You worked hard to get your license. You went through a lot to get your station set up and working. So get your signal out there! No matter what the conditions are, there will always be somebody to talk to. Every new contact is an opportunity to get to know another ham. Every follow-up contact or sked is an opportunity to get to know them better.

Most hams have no trouble thinking of things to say to each other. You can talk about your gear. You can talk about the weather. You can talk about the state of ham radio.

I like to try to come up with other things not related to radio. I ask about hobbies and interests. I ask what books he or she has read recently. It is easy to come up with things to say if you put your mind to it.

The proudest award in your shack should be your Rag Chewer's Club Certificate. Not administered by the ARRL since 2004, the Society for the Preservation of Amateur radio (SPAR) has taken on the responsibility for this time honored tradition. For more information, Web on over to **www.spar-hams.org/**

❖ Give the Gift of an Eyeball Contact

When was the last time you showed up to a club meeting, Hamfest or other ham radio gathering? Heck, when was the last time you asked a buddy on your repeater to meet you for a cup of coffee? The gifts of time and presence are the most precious of all. More than a few first time eyeball contacts have turned into my most lasting friendships.

I have often said that we owe many debts to the more senior members of our hobby. Many of these folks were around when amateur radio was young. Some of these folks just can't get around like they used to. More than a few find themselves in housing situations that making continuing in ham radio a difficult, if not impossible, task. Why not give the gift of a little of your time and pay a visit to a few of these folks that you know?

Our hobby is a great gift, given and received. May this Holiday Season find you peace and may the coming New Year find you prosperity. Meanwhile, I will see you at the bottom end of 40 meters.

UNCLE SKIP'S CONTEST CALENDAR

ARS Spartan Sprint
Dec 2 0200 UTC - 0400 UTC

ARRL 160-Meter Contest
Dec 5 2200 UTC - Dec 7 1600 UTC

ARRL 10-Meter Contest
Dec 13 0000 UTC - Dec 14 2400 UTC

Run For The Bacon QRP Contest
Dec 15 0200 UTC - 0400 UTC

MDXA PSK Death Match
Dec 20 0000 UTC - Dec 21 2400 UTC

QRP ARCI Holiday Homebrew Sprint
Dec 21 2000 UTC - 2400 UTC

Stew Perry TopBand Challenge (160 Meters)
Dec 27 1500 UTC - Dec 28 1500 UTC

Original QRP Contest
Dec 27 1500 UTC - Dec 28 1500 UTC

Straight Key Night
Jan 1 2009 0000-2400 UTC

Outer Limits continued from page 59

shows play music much older than that from the 1900s. (Belfast)

❖ QSLing Pirates

Reception reports to pirate stations require three first class stamps for USA maildrops or $2 US to foreign locations. The cash defrays postage for mail forwarding and a souvenir QSL to your mailbox. Letters go to these addresses, identified above in parentheses:

PO Box 1, Belfast, NY 14711
PO Box 109, Blue Ridge Summit, PA 17214
PO Box 146, Stoneham, MA 02180
PO Box 293, Merlin, Ontario N0P 1W0.

PO Box 69, Elkhorn, NE 68022 is no longer a valid address.

Some pirates prefer e-mail, bulletin logs or internet web site reports instead of snail mail correspondence. The best bulletin for submitting pirate loggings is the e-mailed *Free Radio Weekly* newsletter, free to contributors via *freeradioweekly@gmail.com*. A few pirates will sometimes QSL reports left on the outstanding Free Radio Network web site, at **www.frn.net**. *The ACE*, a formerly widely read print bulletin, now has a good loggings section and a valuable archive of *Free Radio Weekly* issues at **www.theaceonline.com/**

❖ Thanks

Your loggings and news about unlicensed broadcasting stations are always welcome via 7540 Highway 64 W, Brasstown, NC 28902, or via the e-mail address atop the column. We thank this month's valuable contributors**:** Brian Alexander, Mechanicsburg, PA; Skip Arey, Beverly, NJ; Kirk Baxter, North Canton, OH; Jerry Berg, Lexington, MA; Artie Bigley, Columbus, OH; Richard Cuff, Allentown, PA; Rich D'Angelo, Wyomissing, PA; Gerry Dexter, Lake Geneva, WI; Bill Finn, Philadelphia, PA; Harold Frodge, Midland, MI; Captain Ganja, Belfast, NY; William T. Hassig, Mt. Prospect, IL; Harry Helms, Corpus Christi, TX; Bob Hill, Littleton, MA; Ed Insinger, Summit, NJ; Ed Kusalik, Camrose, Alberta; Chris Lobdell, Tewksbury, MA; Greg Majewski, Oakdale, CT; Dan Malloy, Everett, MA; A. J. Michaels, Blue Ridge Summit, PA; Lee Reynolds, Lempster, NH; Lee Silvi, Mentor, OH; John Wilkins, Wheat Ridge, CO; and Joe Wood, Greenback, TN.

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Let's Talk about Antenna Feed-Lines

The last three *Antenna Topics* columns have discussed some characteristics of antennas, antenna systems, and how to use them to improve communications. This month let's discuss an important part of our antenna systems: the antenna feed line.

Using an appropriate, good-quality feed line can sometimes mean the difference between good communication and poor or no communication. This is especially true when working with weak signals and signals in the VHF range or higher in frequency. So let's discuss some of the different types of feed lines in use today, and also the concept of impedance as it relates to maximizing their effectiveness.

WIRE LINES

Single-Conductor Lines

A single conductor, such as a copper wire (fig. 1A), can be used as a feed line to an antenna. When this is done in the vicinity of the earth, as is true of most antenna systems, then the earth, by capacity coupling, is considered to be a second feed-line conductor. This provides the function of a wide-spaced two-conductor line. These lines tend to allow undesirable levels of radio-frequency (RF) energy radiation from the feed line. This "lost" radiation distorts the radiation-reception pattern of the antenna which the line feeds: this is often detrimental to good communication.

At UHF and microwave frequencies, a different kind of single-wire feed line (fig. 1B) is sometimes used. This line has funnel-like launchers at each end to transform the impedance at the line's feed points to that of the open line.

Multiple-Conductor Lines
Two-Conductor

Two conductors, held parallel to and separated from each other with good-quality insulation, produce a very low signal-loss feed line. The conductors can be held in place by imbedding them in a ribbon of polyethylene as is done with twin-lead ribbon cable (fig. 1C) and window line (fig. 1D). Ladder line, which gives the lowest loss levels, is made by separating the conductors with insulating separators spaced along the line (fig. 1E).

Because wire lines are not shielded as is coaxial cable (see below), care must be taken to avoid running them close to metal or other conductive objects. They cannot be buried as coax can. Due to lack of shielding, wire-lines radiate into the space around the line some energy that should be going on to the antenna when transmitting or to the receiver in reception. As mentioned, for single-wire lines this distorts the antenna's radiation pattern, which may or may not be a problem.

Open-wire lines which use spacers have the best loss rating (lowest losses) of all types of lines. Window line (wires imbedded in a ribbon of polyethylene with "window" cutouts) run a close second. This makes these lines useful for long runs of line or where the SWR on the line is high.

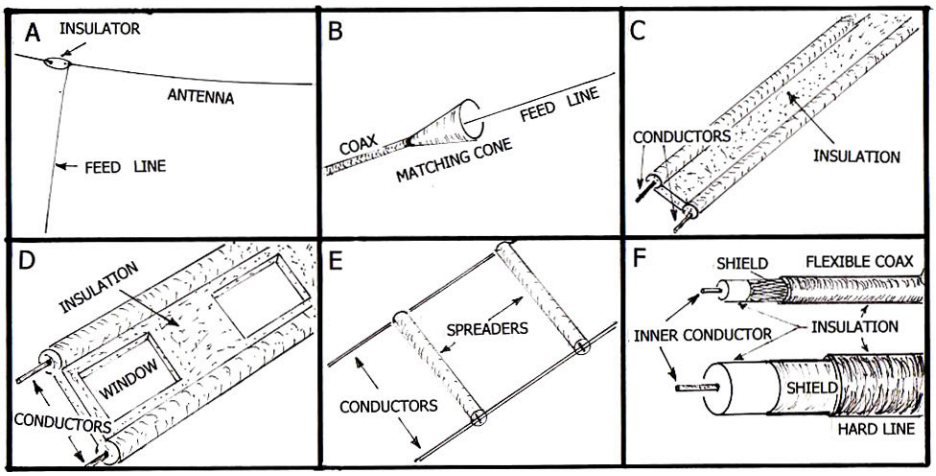

Fig. 1. A SINGLE-WIRE MF-HF ANTENNA FEED LINE (A), A VHF-UHF, SINGLE-WIRE FEED LINE MATCHING "FUNNEL" (B), TWIN-LEAD FEED LINE (C), WINDOW FEED LINE (D), LADDER LINE (E), AND TWO KINDS OF COAXIAL FEED LINE (F).

COAXIAL CABLES

Flexible Coaxial Cable

Flexible coaxial cable (fig. 1F), called simply "coax," is the most common feed line. All coax has an inner conductor, insulation around that conductor, and an outer conductor or shield. For greater shielding, some coax has a second shield of braid or metal foil. Because of this shielding, signals in coax are not much affected by the proximity of other conductors such as metal gutters or metal buildings.

Most of today's receivers, transmittters, antennas, and other communcation devices are designed for use with coaxial cable rather than wire lines. Characteristic coax impedences commonly range from 35 ohms to 125 ohms, with 50-ohms and 75-ohms being the most common. Signal loss varies considerably between the various types of feed line. Foam-dielectric cables have less loss than the plain polyethylene-insulation types.

Hardline Coaxial Cable

The use of long runs of cable, such as distribution lines carrying video signals across a city, necessarily cause some signal loss. Large-diameter, foam-insulation, low-loss lines have been developed to reduce signal loss. One of the lowest-loss coaxial cables is called "hardline" (fig. 1F). Unlike the braid (shield) of flexible coax described above, the outer conductor (shield) of hardline is basically a thin-walled tube, and is much less flexible than ordinary coax which has a braided-copper wire shield. Loss ratings for hardlines approach, but are not as low, as those of open-wire line.

Wave Guides

Losses in feed lines increase with frequency, and as frequency moves into the microwave region, signal losses in coaxial cables may become unacceptably high. In this region feed lines made of hollow conductive tubes called "wave guides" offer lower losses, but at a considerably higher cost. Because of their low losses, wave guides are often the feed line of choice above about one GHz.

Quality of the Line

Feed line can age and become lossy. Some older feed line works fine, but some doesn't. If you plan to use older coax, it's wise to check its quality. Look for discoloration of the inner insulation and for evidence of the

This Month's Interesting Antenna-Related Web site:

To get a feel for factors affecting feed-line loss check out:
www.ocarc.ca/coax.htm
The following sites give discussions of co-axial cable, and its applications:
www.epanorama.net/documents/wiring/coaxcable.html.
Characteristics of different coaxial cables:
www.rfcafe.com/references/electrical/coax_chart.htm

intrusion of water or dirt at the ends. But even good-looking coax can be lossy.

One test is to switch between coax of the same length and type as the old coax for comparative performance. I recently used an RF power meter to test for loss level in some unused coax that was apparently several years old: power-in compared to power-out. The test showed that it had not degraded noticably. On the other hand, some other older, used lines that I have tested have been very lossy.

❖ Impedance and Impedance Matching

All you need to know about impedance in this application are two principles: One is that receiver antenna-input circuits, transmitter RF-output circuits, antenna feed lines, and antenna feed points all offer a kind of opposition to RF current flow called "impedance." The second principle is that, if any two such devices connected together have the same impedance level, then maximum power is transferred between them.

For instance, the amount of energy transferred to an antenna is maximized if both the value of the feedline impedance and the antenna feed-point impedance are the same. This impedance matching in most modern equipment is usually facilitated by the fact that most commercial receivers, transmitters, and some antennas are designed with 50-ohm impedance at their antenna input, output, or feed-point connections. So using 50-ohm coax provides a good match in many cases.

For all feed lines, signal loss increases as any mismatch at the feed line-antenna connection increases. When we must connect together circuits which have different impedances (are "mismatched"), there are various techniques we can use to create a match for these impedances.

Surprisingly, however, in some instances, matching mismatched circuits can be a waste of time and resources! But we'll talk more about this next month.

RADIO RIDDLES

Last Month:

I mentioned the term "mho" and asked: "What is a "mho" anyhow?"

Note that "mho" is "ohm" spelled backwards. "Ohm" is one measure of the resistance a conductor offers to the flow of electrical current. The mho is the reciprocal of resistance, so it is a unit of measure of how well a conductor conducts electrical current.

So a "low mho conductor" is one that conducts poorly: it has low conductance. And that is why I called the poor train conductor a "low mho conductor," Ohm my, isn't that interesting!

This Month:

Consider a transmission line feeding current from a transmitter to an antenna, and the antenna accepting that current. When the antenna has received current from the transmission line, the antenna itself can become a source of current: right? But where will that current then go?

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First Look at the Globe Scout 680

Before we get started this month, I'd like to mention a tip e-mailed to me by reader "Craig." When putting together a power supply for the BC-221 frequency meter that was the subject of our last restoration, I had mentioned the scarcity and expense of high-voltage transformers for vacuum tube circuits. Craig calls our attention to the analog TVs now being put out at the curb in greater and greater numbers as the conversion to digital TV nears.

Keep your eyes open for these TVs, especially ones that use tubes. They can be great sources not only of high voltage transformers, but also of hardware and other electronic parts. All you need is a little patience, a strong back, and a nice roomy trunk!

❖ Why Restore a 1957 Novice Rig?

Last month, we introduced the latest restoration project – a 1957-era AM/CW transmitter designed for the amateur radio Novice market. The Novice license, now no longer issued, had been intended to give would-be hams an easier entry into the hobby. Testing requirements were not rigorous, but operating privileges were limited mainly to CW transmission on a few band segments (see last month's column).

The Globe Scout 680 was produced by World Radio Labs, a popular and prolific manufacturer of ham radio equipment. Like other Novice transmitters produced by competing manufacturers, it was reasonably priced and included capabilities (such as AM operation and full access to most of the popular amateur bands) that the Novice could use after he or she had upgraded to a higher license class.

Many amateurs today enjoy operating classic equipment of the past – even on AM voice instead of the now standard single sideband. I've never done this, but have always wanted to get involved–which is why I was glad to fork over the $50.00 asking price when the little 680 beckoned to me from a radio meet flea market table. It's been sitting under one of the operating tables in my ham shack for a year or two – but every once in a while it would catch my eye and give me a pleasant little buzz of anticipation. Now the time has come to see if the little transmitter can be brought back to life.

Fig. 1. Construction of the Globe Scout 680 is sturdy and compact. It weighs in at 25 pounds.

❖ The 680's Operating Controls

The first things one notices about the 680 are the attractively laid out front panel and its compact, sturdy construction (Figure 1). The approximately 8" X 8" X 14" transmitter weighs in at about 25 pounds in its heavy gauge steel cabinet. Before we get inside the 680 and evaluate its construction and condition, let's take a tour of the front panel and rear apron.

Most of the operating controls are laid out in a strip along the bottom of the panel (Figure 2). From left to right, they are the mic connector; combined main power and audio gain control; transmit/standby switch; phone/CW switch; key jack; crystal socket (also used for VFO input); oscillator tuning control; bandswitch covering 80. 40, 20, 15, 10 and 6 meters; and a meter switch to change the front panel meter between measuring PA (power amplifier) plate and PA grid current.

Fig. 2. Most operating controls are located at the bottom of the front panel (see text).

The upper part of the panel contains only the plate and filament pilot lights; the grid/plate current meter; and the plate tuning and antenna loading controls (Figure 1). Finally, the rear apron facilities (Figure 3) include (left to right) coax connectors for the hf (80-10) and six meter antennas; a switch allowing accommodation of either a high impedance antenna such as a long wire or a low impedance (52-ohm) antenna; a second switch allowing changeover between crystal and vfo control; an auxiliary socket for power input/output and connecting a transmit/receive relay; a fuse and, of course the power cord.

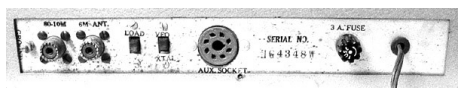

Fig. 3. On the rear apron are the antenna connectors, antenna type and vfo/crystal selector switches, accessory socket and fuse.

❖ Inside the Transmitter

The cabinet is easily removed from the chassis/front panel assembly by taking out the six sheet metal screws holding the panel to the cabinet and an additional screw, in the back, holding the cabinet to the chassis. Once exposed to view, the top of the chassis proved to be coated with a thick layer of heavy dust (Figure 4) – which was surprising because the chassis is completely enclosed within the cabinet and the cabinet ventilation holes don't look big enough to pass such dust. However, some experimental wiping showed that the chassis is relatively clean and uncorroded under the coating.

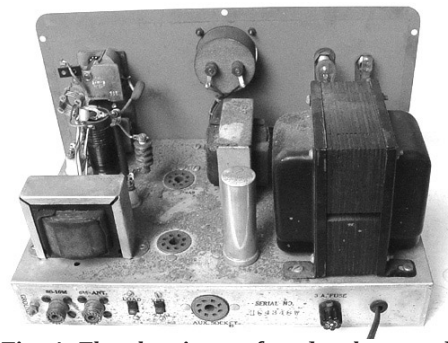

Fig. 4. The chassis was found to be coated with a heavy layer of dust, but there is minimal corrosion.

Remembering that this unit was sold either as a kit or factory wired, it was with great interest that I turned the unit upside down to peek under the chassis. One look showed that there was nothing to be concerned about. Not only was the 680 obviously factory wired, with long leads neatly cabled, but also the underside was completely dust free with the parts looking as if they had just come from the factory.

One consequence of this unit having been factory wired is that most parts are fastened by rivets rather than screws and nuts. I examined all rivets retaining tie points for chassis grounds very carefully. Looseness or corrosion at these locations can cause problems that are difficult to diagnose! However, everything

looked clean and tight.

Another plus was the absence of paper capacitors. Fifty-year-old paper capacitors are not to be trusted, and replacing them en masse is the first step in most radio restorations. But in this rig, the only fixed capacitors in evidence were disk ceramics and electrolytics (the latter will definitely need replacement).

Other components of concern are located within the "Couplates" (Figure 5) used for coupling between the audio circuits. Manufactured by Centralab, these wafer-like sealed capacitor and resistor networks were primitive forms of our modern printed and integrated circuits. I have my fingers crossed about these, because if any components have failed within them, the networks will have to be replaced by individual components that will need quite a bit more room than the compact wafers.

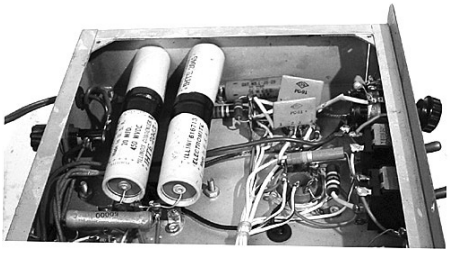

Fig. 5. Underneath, the chassis looked mint. Note the two high-voltage electrolytics, each made by series-connecting two 20 uf, 450-volt units. The rectangular wafer-like units at upper right are "Couplates" (see text).

❖ Preliminary Testing

Carefully examining the circuitry, I saw no burned components or other signs of trauma. The fuse in the transformer primary was intact and was the correct 3-ampere size. But, as was common with zip cords of the era, the line cord had not aged well. It was cracked and disintegrating, exposing bare wire in several locations. I had to replace it immediately in order to continue with the preliminary testing of the 680 – which would involve application of power.

With the new line cord installed, I removed the 5U4 rectifier tube – which would prevent high-voltage d.c. from flowing though the circuitry – and switched on the power. I expected to see the filament pilot light come on and the tube heaters light up, but everything remained dark. I was surprised, because not many sets fail this initial test. Suspecting a fried power transformer, I began making voltage checks.

Yes, the transformer primary was getting power. Yes, there was a normal 5-volts across the filament terminals of the 5U4 rectifier. And yes, there was high voltage (670 volts, in this unloaded test, to be exact) from each of the 5U4's plate terminals to ground. Not having worked on as many transmitters as receivers, I found this latter measurement to be quite sobering. It meant that there were over 1300 volts across the full high voltage secondary of this transformer. There was quite a lethal punch lurking within the innocuous-looking cabinet of this little transmitter!

It wasn't until I began checking the 6.3-volt secondary of the power transformer that I remembered something I had mentioned myself in the previous column. The accessory socket on the rear apron – now empty – needed to have a plug with a jumper to complete the filament circuit. Without the jumper, the transmitter can be powered from other sources for mobile operation.

What I need to do is make an octal plug from an old tube base, wire in a jumper, and insert it. But for present purposes, I connected a clip lead across the proper two socket terminals before switching the unit on again. Now the tube heaters and the "filament" pilot light came to life – which was quite satisfying.

Incidentally, in the schematic I have, the "filament" pilot was connected to the transformer ahead of the jumper. That way it would have come on during my first test – though the actual filaments had not. However, connected that way, it would not illuminate with the jumper removed and outside power applied to the filaments.

With the little design change in my unit, the pilot does *not* illuminate with the jumper removed unless the filament circuit is being supplied by an outside source. Makes much more sense!

To finish up my preliminary tests, I checked all tubes and found them to be good. Now, before moving on to test the operation of the transmitter, I want to replace the electrolytic capacitors. The electrolytics in two locations are specified as 12 uf @ 700 volts. Tubular electrolytics aren't generally made with such a high voltage rating. Instead, the 630's designers chose to use two 20-uf, 450-volt capacitors in series (Figure 5) at each location.

According to the formula for two series capacitors, the total capacitance would be C1C2/C1+C2=400/40=10uf. And the voltage applied across each capacitor would divide in the proportion of the total capacitance of the pair divided by the capacitance of the individual capacitor – or 10/20 = 1/2. And so when 700 volts is applied across this pair of series capacitors, 350 volts would appear across each one – well within its 450-volt rating.

See you next time, when we'll install the electrolytics and try an operating test.

Letters continued from page 7

been able to find any information. This is the first site I have found that has a picture of it.

"Do you know of any sources for schematics for DF receivers? I have tried Nostalgia Air and Techpreservations among others. I contacted Raytheon but they had no record of any model like this. They said their archives only go back to the early '60s, though.

"Great column, one of the first I read every month."

Mike Martel, KC2MQH

"When I clicked on the web site (above) ... The Coastal Navigator FR662B is the one that I have. The little door on the left end is for 'D' size batteries and the radio plays vary well. The small 'Red Button,' when pushed and held, lights the dial and shows battery condition.

"For kicks I am sending you a picture of a small portion of my shack.

"Right at this time I am into all the in's and out's of the Scancat-Lite Plus Program's new 1.4.4 update. It works quite well with my Pro-96's and BCD996T. I am 68 and it comes a little slow, but I am getting there. I have used many different versions of the Scancat-Lite Plus...

" I still have my BC-100 with 16 programmable channels. We sure have come a long ways."

Dave Keniston KB1LLI

Dave Keniston (KB1LLI) is in search of an instruction manual for his Coastal Navigator FF662B DF receiver. If anyone has any ideas, please drop a line to kevincarey@monitoringtimes.com.

Grundig Satellit 750 – Eton's New Flagship Radio

By Larry Van Horn, N5FPW

Etón Corporation recently released its long awaited Grundig Satellite 750 LW/AM/SW/FM portatop radio, and the *MT First Look* team had a chance to put the unit through its paces. Esmail Amid-Hozour, CEO of Etón Corporation, says "The Grundig Satellit 750 is a model of what shortwave radios should be and Etón is proud to offer this high-quality Grundig product to our discriminating shortwave listeners."

When I pulled the rig out of its display box, it was the first time I had seen it, and my first impression was of a radio with a bit of a retro look back to an earlier era. I have owned a number of portables through the years, and this radio's general appearance reminded me of some of the beefier portables from the late '70s and early '80s. It has two large handles on each side of the radio, a carrying handle on top of the radio, and a rotatable ferrite coil antenna for longwave/broadcast band reception. The signal strength indicator is an analog meter, not the normal LCD segmented meter you see on portables offered in today's marketplace.

The Satellit 750 offers complete coverage of long wave, medium wave, and shortwave radio frequencies. Shortwave coverage includes the reception of the single sideband (SSB) mode allowing the reception ham radio operators, maritime and shortwave aeronautical stations. You can select either wide or narrow selectivity to reduce co-channel interference and you can tune stations using the conventional tuning knob, quick keypad entry or via the 1000 memories that the user stores.

The 750 also receives the VHF aeronautical band (118-137 MHZ), and the FM broadcast band (stereo reception available via the headphone jack).

❖ Inside the Box

The radio was well packaged in its display box and it comes with an AC/DC wall wart, owner's manual, and warranty registration card. The case is made of a black hard plastic and overall construction appears to be solid.

Overall ergonomics are fair. Number buttons and other major control buttons are large and have a good feel. The display is large and easy to read, especially with the amber backlighting on.

❖ Tuning Around

When I applied power and tuned around in the AM/FM bands, I noted that the radio provided good audio quality and volume. Reception on the FM broadcast band in our rural area, even on the internal whip, was very good. AM broadcast band reception was reasonable, but I had to cut off all the laptop computers in the shack. When they were on, signals on the AM band, except for local stations, were completely covered up by extensive computer interference. I do not have this issue with any other radios or portables in my shack.

On the plus side, I did note that the 750 has a lower noise floor than on some previous models of Etón radios, specifically the E1XM. This may have more to do with the type of display used on these radios than anything else.

Overall rating: 2 and 1/2 stars

Shortwave reception sensitivity was good throughout most of the tuning range. Unfortunately, we could not find any signals above 17 MHz that we could compare with our base line portable test receiver (a Sony ICF-2010), due to the low sunspot numbers. The signal strength of single side band (SSB) stations in the HF spectrum was good, especially compared to some other portables we have tested in recent times.

My biggest disappointment with this radio is the way it handles the tuning of single sideband (SSB) signals. There are several conventional and well established ways manufacturers have handled this chore over the years. In a rather "convoluted" approach, the Grundig Satellit 750 method of tuning in SSB signals combines them all.

The Grundig has a USB/LSB mode selection set up on one button (like the later model Drake radios), but further tuning is required using a "BFO" (beat frequency oscillator) control. This BFO is not a fine tuning knob, and, yes, on the model I tested I could change my sideband selection by twisting the BFO knob in the opposite direction than my original tuning setup. This brings up all sorts of issues regarding accurate frequency readout in SSB, accurate mode reporting, and other issues while operating this radio in SSB.

If the '750 had just included some finer tuning steps, a push of the USB or LSB button could have tuned to the proper offset, and the BFO control could have been eliminated. While this radio has the sensitivity to receive SSB signals in the utility and amateur radio bands, the tuning method is a detriment to accessing those signals easily, accurately and properly.

The base and treble controls allow for a wide range of adjustment so you can set the audio just right for the station being received. The wide/narrow filters are selectable regardless of mode on all bands except Air. This is something you normally don't see on most portable radios and is a welcome feature.

One of the common complaints about the feature set of this radio is the lack of synchronous detection. That doesn't bother me as much as the lack of an automatic loudness control (ALC) and automatic gain control (AGC) features. You will be riding the volume control quite a bit as you tune around with this unit, due to the lack of an ALC control. It appears that the AGC is set for a slow recovery and it is not adjustable.

MT FIRST LOOK RATING (0-10 SCALE)

Audio Quality	6
Audio Levels	6
Sensitivity	5
Back light	5
Display	6
Battery Life	6
Ease of use	7
Feature Set	5
Keyboard/Button/ Control Layout	5
Manual	3
Overall Construction	5
Overall Reception	5

❖ Overall Rating and Final Thoughts

Overall, I have mixed feelings about the Grundig Satellit 750. Contrary to the way some have characterized this radio, I do NOT believe it is a major improvement over the now discontinued Grundig Satellite 800. And, as is the case with most radios, there is room for improvement, especially at the suggested MSRP of $399 (street price $299).

Probably my biggest concern with the Satellite 750 is that it is a double, not a triple conversion radio. We didn't experience a lot of problems in this regard here in Brasstown, but I am not sure that will be the case by other end users in more robust RF environments.

On stronger SW radio signals, when connected to an external antenna, I did note several instances of dynamic compression. The radio just could not handle the amount of signal being fed to it. When we would switch from the external antenna to the whip, the signal strength would improve dramatically, in some cases 20dB or more.

The manual gets an "F." It is not well written, has some obvious errors, uses very small type, and it is printed in low contrast grey ink, which makes it very hard to read.

As with its predecessor, the Satellit 800, it appears there may be some quality control issues. The VFO knob wobbles and is entirely too loose. In the past, Satellit 800 users reported the tuning knob eventually falling off. A quick check with other radio enthusiasts who have used the 750 indicates that their units also have wobbly tuning knobs.

I am not a fan of the battery contacts or battery compartment. The "+" side uses a coil of wire rather than a metal plate like a lot of other radios. It is only a matter of time before the batteries will have a problem maintaining contact and providing power. This has been seen on more than one model of portable radio where wire coils have been used for the positive contacts.

The other issue is that the battery compartment door is flimsy. It's a pretty tight fit, and if the door is not seated and secured properly, the weight of the batteries will cause the door to pop open and you will have D size batteries spilling out of the back of the radio.

I discovered this issue when I tried to tilt the radio during AM broadcast reception. This radio's design is not conducive to tilting. Not that you can't, but your batteries may fall out, and it is difficult to maintain a tilt, since it is not designed for it.

Another power issue is that this radio uses a wall wart that is center pin negative, Yes, the shield is hot. You need to keep this in mind if you are going to use an alternative power source or need to replace the AC/DC wall wart.

The AM/LW rotatable antenna works well, but if you put your hand on it anywhere but the at end of the bar to turn the antenna for null or peak reception, it will skew the reception pattern when you remove your hand. The compass rose style dial below this antenna is probably of little use, as it is hard to read and appears to be slightly off in calibration.

I also noted that the radio exhibits a chuffing sound when turning the tuning knob at a moderate tuning speed. This is probably an indication of muting and may result in a signal being missed while doing band scans. I also received a report from one listener that his radio exhibited some sort of noise when tuning the VFO rapidly. However, we did not notice this effect on our unit.

Finally, the volume control is not where you would expect to find it. Granted, I am right handed, but most radios do put their volume controls on the right hand side of the radio. The bass, treble and volume controls are all on the left front side of the radio. Given the lack of an ALC, and my constant riding of the volume control as I tuned around, it was a nuisance to keep reaching across the radio to turn the knob up or down. Also, the shafts for these controls are very short (about 1/4 inch) and I have a concern about the knobs falling off over time.

Overall, signal sensitivity appears to be very good for a receiver in this price category, and there are some other neat features I like on the 750. But several of the other issues may make these points moot to some. Time and the marketplace will be the final determination whether the Grundig Satellit 750 lives up to its billing as the new flagship of the Etón receiver line.

FEATURES/SPECIFICATIONS

- Serial Number: S750808000214
- Manufactured in China
- Frequency Coverage:
  Longwave 100-519 kHz;
  AM 520-1710 kHz (US/Canada)/522-1620 kHz (selectable);
  SW 1711-30000 kHz;
  FM 87.5-108.0 MHz (US/Canada)/76-108 MHz (rest of the world);
  Airband 118.0-137.0 MHz
- Tuning rates

	FM	AM	SW	Air Band	SSB mode
Fast	1 MHz	10 kHz	5 kHz	.025 MHz	5 kHz
Slow	.01 MHz	1 kHz	1 kHz	.001 MHz	1 kHz plus manual tuning with BFO

- Selectable 9/10 kHz AM broadcast band tuning steps
- Selectable/tunable Single Side Band (SSB) reception
- Auto/Manual/Direct frequency key-in and station memory tuning
- Control knobs: Bass, treble, volume, SSB BFO, squelch, RF gain
- Antenna Attenuator: 0/-10/-20 dB
- Auto Tuning Storage function (ATS) for AM/FM/LW
- 1000 station memories (50 memories (MW/LW) 100 memories (FM/SW/SSB), and 500 customizable)
- Bandwidth button: Wide/narrow selections for all bands except Air
- Dual alarm clock function
- Audio: 4 inch, 8 ohm speaker at 2 watts audio output
- External audio jack: 1/8 inch (3.5 mm) stereo reception
- Power consumption: 80 mAh (without backlight)/90 mAh (with backlight)
- Power: Four alkaline D size (UM1) 1.5 volt batteries or four 1.2 volt rechargeable batteries; and AC/DC wall wart: 120VAC/6VDC 500 mA center pin = negative polarity
- 3.5 mm line in jack on front of the unit that will enable you to use the radio speaker for MP3 playback)
- Left/right RCA line out jacks (radio broadcasts can be transferred to recording device/audio amplifier)
- External antenna jacks:
  External 50 ohm BNC jack for FM
  External 50 ohm BNC jack for SW
  External 50 ohm 3.5 mm jack on the ferrite antenna for AM reception
  External 500 ohm (nominal(antenna clips for a random wire antenna (red clip) and ground connection (black clip)
- Internal whip antenna for FM/SW reception
- 360 degree rotatable ferrite antenna for AM/LW reception
- Internal/External antenna switch (LCD display indicates what position that switch is in)
- Dimensions: 14.65"W (372mm) x 7.21"H (183 mm) x 6.02"D (153 mm)
- Weight: 5.9 lbs (2.66 kg)
- Includes owner's manual, warranty card
- One year parts and labor limited warranty (North America) and two years parts and labor limited warranty (Europe)

** Specifications subject to change*

John Catalano, PhD
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RadioCom 6 – The "Have It All" Radio Program

Before you do anything, take a look at Figure 1 showing just some of the features available in RadioCom 6 (RC6) from Bonito. I think you will be as impressed as I am…and this is just a snap shot of RadioCom 6's wealth of useful capabilities. These include receiver/transmitter control for over 100 receivers and transceivers, extensive digital signals decoding, DSP filter and audio spectrum analysis, satellite tracking, dual trace audio scopes and two radio simultaneous control. All these are within ONE program. How's that for a list!?

But first, we must make our PCs ready for RC6. That is the goal of this month's column. So let's get started.

❖ Radios

RC 6 will work with any stable radio with SSB capability and an audio output jack. However, to take full advantage of its features, PC-controlled radios from Yaesu, Icom, Kenwood, JRC, AOR and Skanti are recommended. More radios and manufacturers are being added to RC 6's 100+ list as we speak.

❖ PC Needs

For starters, forget about using that ten-year-old PC in the closet. To perform all these tasks takes processing power! The RC6 manual says it requires a "Pentium/Celeron processor with at least a 1GHz, 512MB RAM a bi-directional sound card with a line-in, a spare COM port and Windows 2000/XP/ Vista ...and a graphics card with 1280 x 1024 16 bit colour resolution." The manual gives 512MB RAM as a minimum while the RC 6's box says 256MB RAM. Bet you can guess which one was printed first.

Notice the words "at least." I ran RC 6 on a laptop PC with a 1.6 GHz Duo Core T2060 CPU, 2 GB of RAM with a Vista Home Basic operating system. Even on this relatively "modern" PC, when all functions were "firing," the screen still hiccupped for a second or two. I would recommend at least a Pentium 4, 1.4 GHz processor and 1 GB RAM.

The sound and video cards must have at least the stated specs. However, RC 6 can use the sound card's Mic-in as well as the line-in to obtain the radio's audio. This is quite important since some laptops (such as mine) only provide a Mic-in jack.

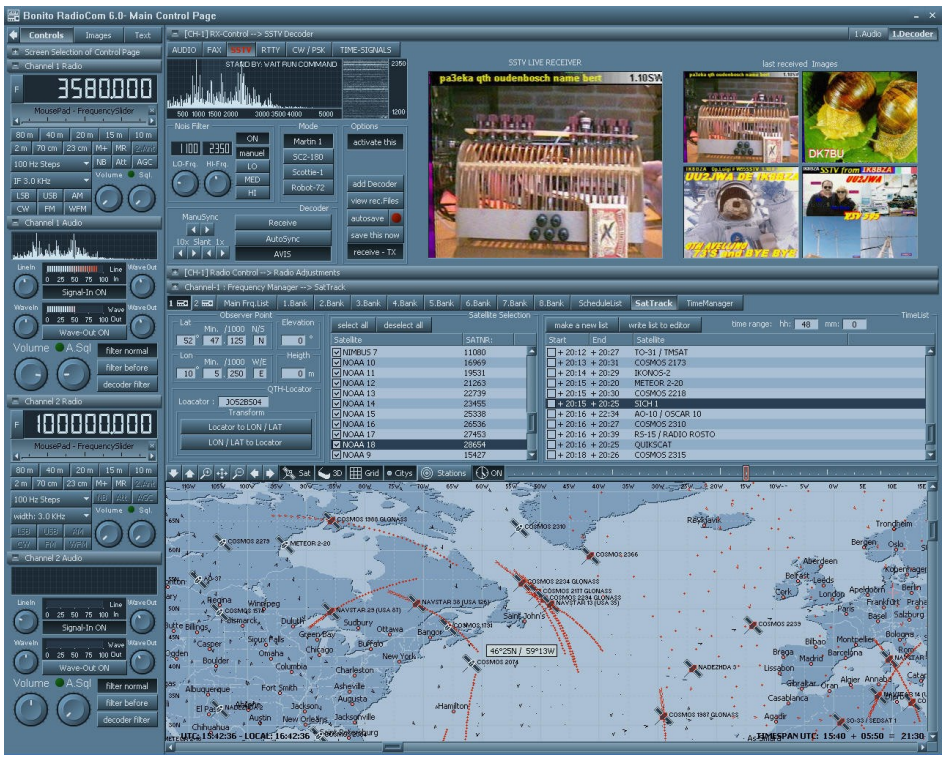

Figure 1 Feast your eyes on just one of RadioCom 6's feature-rich displays

❖ Switch Box Interface

We first looked at RadioCom in this column a few years ago when it was in its version 4 or 5. Much has been added since then. But one thing has remained the same. To use RC 6 you must have a piece of hardware called a switchbox. This is included in the box when you purchase RC 6 and is shown in Figure 2. This small box has 9-pin connectors at each end, one male and one female. Since RC 6 controls the radio via the PC's serial port, one end is connected to the PC and the other to the Radio's interface.

Figure 2 The RadioCom switchbox is a hardware form of copy protection called a "dongle."

The switchbox comes in two flavors; RC Ham and RC SWL. I assume that the Ham version allows for transmitter and receiver commands and functions, while the SWL is receiver only. The RC Ham was provided with our RC 6.

If the switchbox is not connected, RC 6 will not run! In this sense, the switchbox is actually a hardware form of software copy protection. The required plug, or in this case, switchbox, is referred to as a "dongle."

For our testing we used the venerable Icom PCR1000 as our radio. Therefore the cable from the 1000 mated to the free end of the switchbox.

The switchbox may also have an electrical purpose. One of RC 6's spec sheets states, "The supplied plug-in module already contains the electronics for the respective radio." I'm not sure if this means that it contains a level converter. Since the output of the PCR1000 is already at PC serial port levels, no level converter is usually required.

❖ COM On!

Surprisingly, the one thing my "modern" laptop was missing was a serial port. The slower serial input port, usually a 9-pin connector, has been replaced by the Universal Serial Bus. You know it as USB.

Ten years ago, when I was involved with Intel and Microsoft, they were evangelizing the virtues of USB. If you spoke against the USB concept, you more than likely would not get a welcome at Sunnyvale or Redmond. Since my company's product was a serial input

device, I was considered the President of a rogue company, but was later "brought into the fold."

Figure 3 IO Gear USB to serial converter/adapter GUC232A

Needless to say, their campaign was successful. So successful that today only the USB connector exists on most (if not all) laptops and many desktops. The 9-pin serial port has been added to PC antiquity, except if you own equipment that requires one…such as RC 6, the Icom PCR1000 and many, many other PC interfaced radios and peripherals. So now what do we do?!

One solution is a USB to Serial converter cable. This is a small, relatively inexpensive device. It connects to the PC's USB port, but has a 9-pin serial connector at the other end and the requisite electronics in between.

In a recent column we introduced the IO Gear converter model GUC232A USB to Serial Adaptor. This is available from **www.Cyberguys.com** (Item # 104 0475) at $19.95 plus shipping. See Figure 3. This device is so useful I keep one in my laptop bag at all times. Tell them you saw it in the *MT Computers & Radio* column for extra special treatment.

Once installed, the PC will recognize the converter, and the 9-pin connector acts just like a regular serial port…well almost.

I am constantly surprised at the number of people who never read instructions. If you're one of them ask, yourself this question, "If instructions are not important, why do companies spend extra money to produce them?" I encourage you always to read instructions, no matter how simple and trivial you *think* they might be.

Installing the GUC232A in Windows XP or Vista is very easy if you follow these steps ***exactly***.

1. First, create a new folder on your Desktop to hold the driver you are about to download.
2. Next, go to the IO Gear website **www.iogear.com/support/dm/driver/GUC232A#display** Download the latest driver for the GUC232A AND your operating system (Visa, XP, Vista 64 etc) to the folder you created. Make sure you have the correct operating system.
3. If needed, unzip the file into the same folder. Then delete the ".zip" file. I suggest at some point you burn a CD with the new driver and keep it with the converter.
4. Now plug the GUC232A into a USB port. If your PC has more than one USB port, remember which one you have used. It does make a difference.
5. Once Windows "sees" the converter, it will open a driver selection window. Select the option, which allows you to choose the location of the driver, usually the second one listed.
6. Using the "browse" button, go to the folder where you downloaded the driver. Click on the folder and then the sub-folder with the name of your operating system, e.g., Vista.

If Windows does not give you a driver install window but instead performs the install without user intervention, wait until Windows does its thing, then follow instructions in the Updating Drivers paragraph below.

If you have done all the steps *exactly*, the rest is automatic. And the converter is now installed.

❖ Are We There Yet?

Almost. BUT we have two more important parameters to set before we can use it reliably; COM port number and Flow Control.

Windows numbers COM ports from 1 to 99. However, much software and hardware produced prior to 2005 can only be used with COM ports numbered between 1 and 9. Even older products can only use 1 to 4.

The other parameter is called "Flow Control." This determines how the data flows between the PC and what is connected to the port. Three options are possible: None, Hardware and Xon/Xoff. We'll set these in Windows Device Manager found in the Control Panel.

Follow the Steps - Again:

A. Left click on Start, then Control Panel and then Device Manager.
B. About 3/4 of the way down the resulting list, you will see "Ports (COM & LPT)." Left clicking this will reveal "ATEN USB to Serial Bridge."
C. You know the drill. That's correct. Left click on "ATEN USB to Serial Bridge."
D. Open the final menu with a left click on the "Port Settings" tab at the top on the resulting screen.

Figure 4 shows all three screens Device Manager, ATEN and Port Settings opened. Hang in there. It sounds more complicated than it really is.

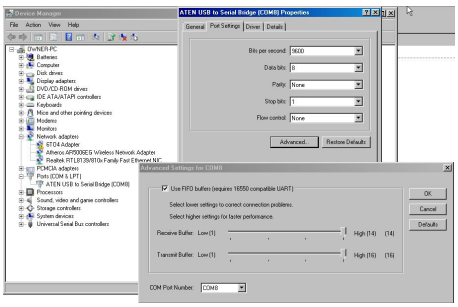

Figure 4 Three open windows: device manager," "ATEN USB to serial bridge" and "port settings."

At the bottom of the Port Settings window, you will see "COM Port Number:" and a dropdown arrow to the right of the number. From this menu select a number, which is NOT used by some other device. You are usually safe with the higher numbers. Remembering that RadioCom 6 needs a COM number between 1 and 9, we have chosen 8.

This means that some very old software, requiring a number between 1 and 4 will not work. However, our choice of 8 will capture most of our radio applications, including our targeted RadioCom 6.

❖ Flow – Hit or Miss

The Flow control setting is not as simple, and is really quite dependent on both the hardware and controlling software. I suggest you start with "None." Select OK and then close all menus.

Kudos - You've done it! This configuration – COM 8 and Port Control set to "None" – was tested and worked with RadioCom 6, RadioMax, TalkerPCR, Icom OKA and Ham Radio Deluxe on my Vista Home Basic laptop.

Setting Compatibility

Icom's IC-PCR-1000 program also worked. However, its "Compatibility" needed to be set to "Windows 98" or else upon closing it would freeze the computer. This procedure is useful for running many programs under Vista that were designed for an earlier Windows operating system, such as XP, 2000, ME, 98 and even 95.

To start, right click on the program's icon. Next, select "Properties" at the bottom of the list. Then click the "Compatibility" tab at the top. In the dropdown Compatibility mode menu select "Windows 98 /Me."

Put a check in the "Run this program …" box and select "Apply." Then close all menus. Now start the program by clicking on its icon and all should go as planned. It works with about 80% of the Win 98 and newer programs.

❖ Updating Drivers

New drivers to correct bugs or add features are always being released. Here is a simple procedure to apply a driver update.

Once you have downloaded the new driver to a new folder (and unzipped it if necessary) follow the directions above to navigate to the Device Manager screen.

Go to the "ATEN USB to Serial Bridge" screen via the Device Manager, as seen in Figure 4. Click the "Driver" tab at the top. Then click "Update Driver."

Select "Browse My Computer For Driver Software," the second choice given.

Finally, direct the resulting screen to the folder where you downloaded the new driver. The rest should be automatic.

❖ Using Your Knowledge

Now that we have installed a USB to Serial converter, it will be useful for many radio and non-radio applications such as connecting to an older PDA. The driver installation and updating procedures, of which you are now an expert, will come in handy, as devices and software evolve and improve periodically. Well done.

Next month we'll set up the PC sound card. It's simple when you know how, but getting that knowledge took an hour of my life for this application. (By the way, did I ever tell you that I HATE SOUND CARDS?!) I'll try to save you the time by giving you some "what to look fors." Then we'll actually see what RadioCom 6 can do.

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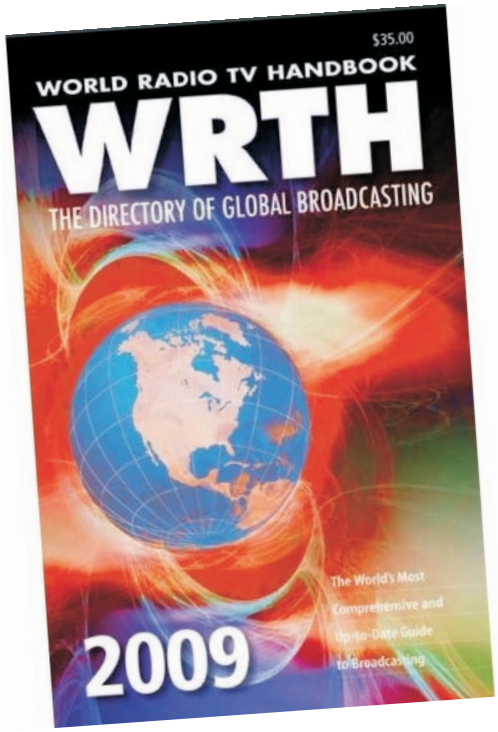

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Are All 9v Batteries the Same?

There have been many consumer advisories reporting the merits of 1.5 volt AA alkaline cells because of their widespread use in toys and hand-held gadgets, but not as much is written concerning 9 volt batteries. I recently conducted a test to see what differences, if any, there were among brands.

Five alkaline brands and one standard zinc-carbon were selected off the shelf – That is, off both my shelf using used batteries, and off the store shelf with new ones. Some of the batteries were U.S. made, others off shore.

I attached a 1000 ohm resistor across the terminals of each battery and measured the voltage, then took voltage readings periodically for several hours, plotting the results on a graph. Using Ohm's law (I=E/R, or current equals voltage divided by resistance), I calculated the initial current drain for each battery, which averaged around 8-9 milliamps depending on the charge state of the battery.

Predictably, as the voltage dropped with time, the rate of drop gradually eased off, because less current was being drawn through the resistance (again, Ohm's law). As expected, the standard zinc-carbon discharged faster than the alkalines.

What wasn't expected was that all the alkaline brands performed virtually identically! Over the 12 hour test period, they lost an average of 5% of their charge.

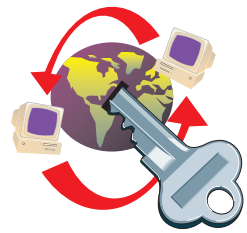
But after the continuous discharge, will shutting off the power reverse the batteries' voltage depression? Yes, measurably and quickly on both alkaline and zinc-carbon batteries. It certainly won't make them new again, but it does bring the terminal voltage up somewhat from its dissipated reading.

❖ The Bottom Line

There's nothing dramatically new to be learned here. Since the chemistry is the same, 9 volt batteries perform identically to their 1.5 volt AA cousins. Choose the alkalines for long-term reliability, and the less-costly zinc-carbons for routine, replaceable, low current applications. And for both chemistries, shop for lowest price!

MT READERS ONLY

To access the restricted website for the month of December, go to www.monitoringtimes.com, click on the key, and when prompted, enter "mtreader" under the user name. Your password for December is "3monthsfree" – Check in each month for new material!



How to make a good radio UGLY: leave the batteries in for an extended period of time.
A Radio Shack outboard battery pack saved the radio.
- Jerry Bilodeau, Belfast, Maine

What's NEW

Tell them you saw it in Monitoring Times

International Callsign Handbook

by Gayle and Larry Van Horn

The radio spectrum is packed with emissions of every imaginable type – pulses, carriers, digital bursts, Morse, frequency-shift keying, sweepers, voice and music, and more. Listeners classify these signals into two major categories: broadcasts and utilities.

The broadcasts are intended for general reception, while the utilities are directed to specific receivers. Fortunately, the vast majority of these signals are coordinated by governments in order to control the prospect of interference with other users.

But even with such formal regulation, identification of the origin such signals is all but impossible without either the revelation by the transmitting agent ("You are listening to the BBC") or the inclusion of a call sign ("This is W8JHD in Brasstown, North Carolina").

But what about those tactical call signs – IDs that are exchanged among common members of a network? Who is Lightning? Blackjack 335? Papa Two Foxtrot (P2F)? Tiger 40?

I remember with fondness my early days in radio, and how mystified I was when I heard identifiers like "Alligator," Sky King," and "Torreador." I also remember how relieved I was to find a resource that could shed some light on these mysterious calls; it was the first edition of Gayle Van Horn's *International Callsign Handbook.*

Gayle's name is very familiar to *MT* readers as our Frequency Manager and Broadcast Loggings editor. Now she and her husband, our well-known Assistant Editor, Larry Van Horn, have combined their energetic talents to compose and publish this expanded and updated volume.

The new *International Callsign Handbook, Volume 2*, is a massive, 1414 page compendium of worldwide call signs and identifiers likely to be encountered throughout the radio spectrum – HF, VHF and UHF. The collection is assembled in Adobe Acrobat format for Windows XP/Vista platforms on a single, self-loading CD ROM, and all contents are fully searchable and printable.

An excellent preface chapter provides a tutorial on call signs and identifiers used in the transmission of radio signals. It grounds the reader in rules of the road, allowing insight into the identification of transmissions to be heard throughout the spectrum in various modes.

A "Quick Guide to the Shortwave Spectrum" is a chart presentation of how the 2-30 MHz spectrum is divided into various services.

The database itself is divided into ten chapters and includes not only internationally-assigned call signs, but fleet identifiers, tactical call signs, ALE addresses, aircraft selective calls and codes, maritime numeric identifiers, and other IDs used in the aircraft, maritime, military, government and civilian services.

Let's try it out

It's quite likely that if you're an addicted utilities hunter like I am, the part of the database that you will use the most is the exhaustive, searchable, alphabetized list. There they were – Panther (Drug Enforcement Agency), Omaha (Customs), Ironrod (AUTEC, Bahamas), Headcap (Civil Air Patrol), NNN0___ (U.S. Navy MARS), Giant Killer (Oceana Naval Air Station), Teal (Keesler Air Force Base), and all the rest!

So, is "Sky King" still used as a shortwave identifier on US Air Force frequencies? I typed it into the Adobe task bar, but nothing came up. I knew that Larry Van Horn had recently told me that the phrase was still in use, so was this one missing?

A quick phone call to Larry revealed the secret: It's not "Sky King," it's "Skyking!" I tried that, and there it was: "All ACC aircraft copy the following transmission. This is a do-not-answer blind transmission." I learned that Adobe requires you to know what you're looking for!

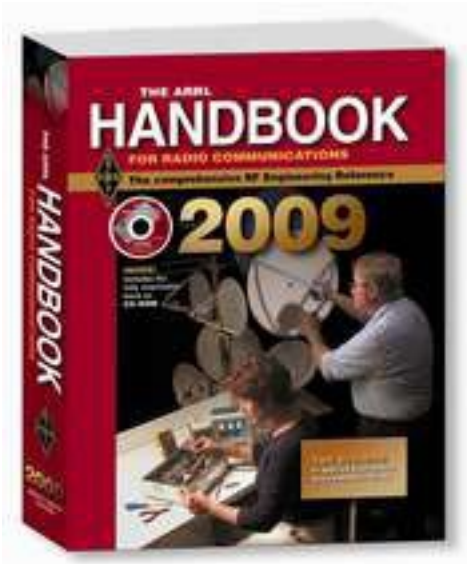
But the list certainly isn't limited to U.S. government and military; there are global airlines, ocean vessels and, of course, foreign governments and their military as well.

Final thoughts

I'm impressed. This is a comprehensive collection of worldwide radio identifiers likely (and even some less likely) to be heard on the air. Over the years the Van Horns have earned the well-deserved respect of the monitoring community. Accurately assembling a collection like this is a mammoth undertaking. Congratulations on a job well done.

(*The International Callsign Handbook* on CD by Teak Publishing is available from Grove Enterprises for $19.95 plus shipping, and from other *MT* advertisers)

Reviewed by Bob Grove



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ARRL Handbook, 86th edition, stock no. 0261, $44.95 plus shipping from the ARRL, 225 Main St., Newington, CT 06111-1494. Web site: **www.arrl.org**. Phone orders: 888-277-5289

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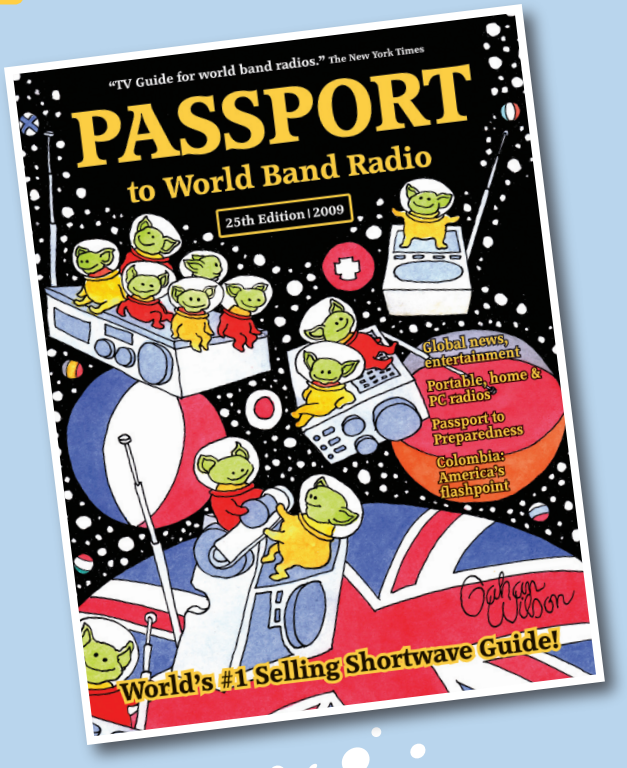

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